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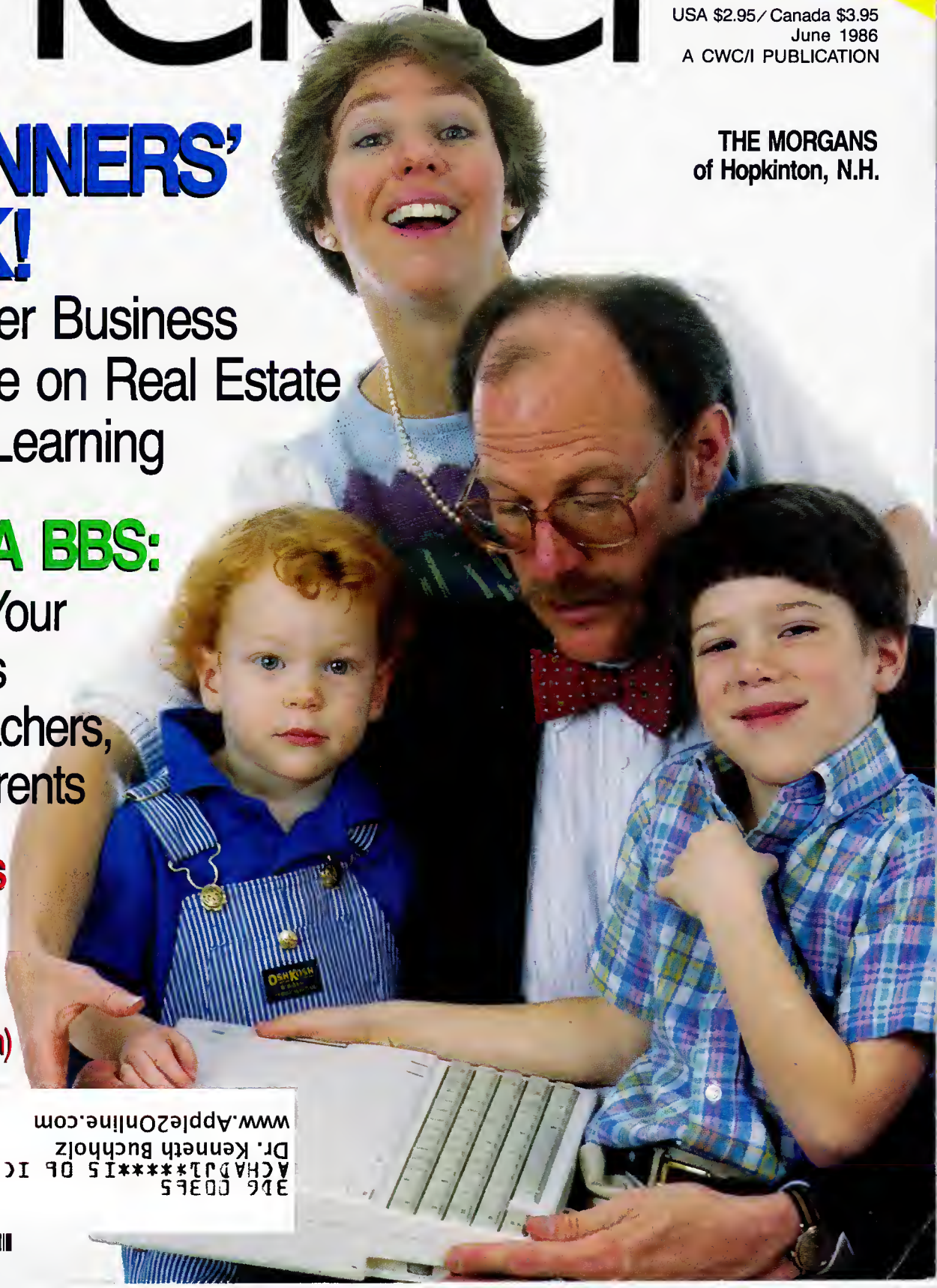
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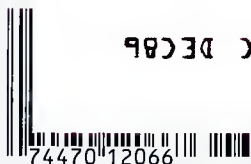
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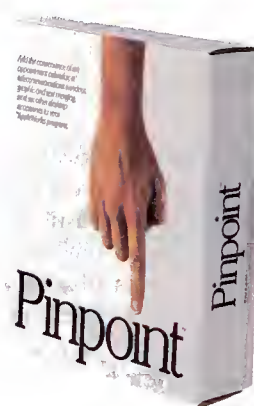
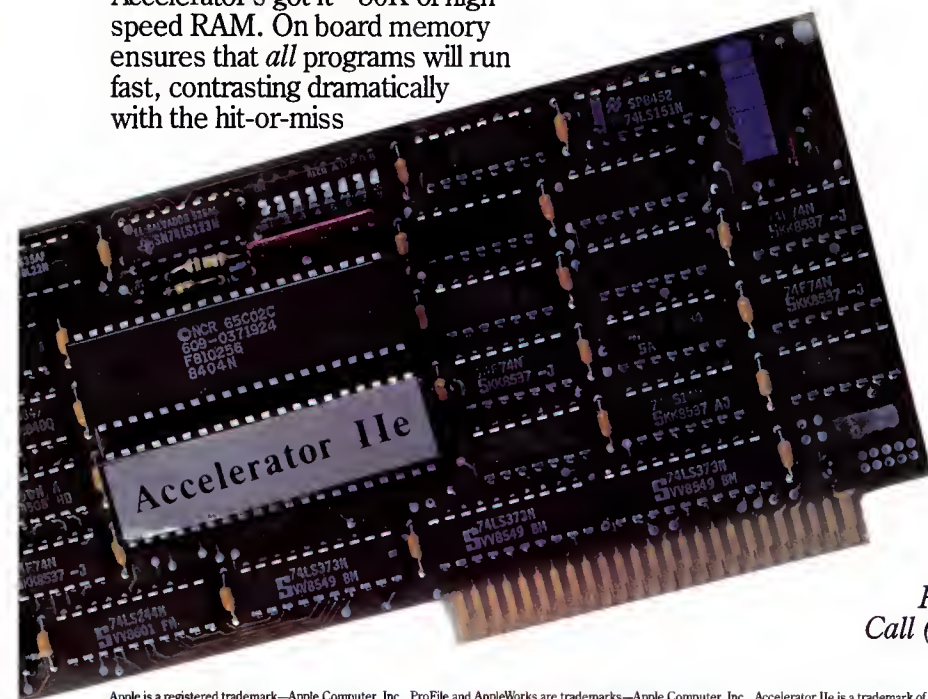
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INCIDER'S VIEW



The Myth of Programming

by Deborah de Peyster

"We'd guess that most students would like to feel in charge of their learning instead of a computer."

We've heard a lot of talk about the potential of the school market, and how Apple's future depends on securing that market. Well, "the market" is really *people* and what they need to do their jobs better. So we decided to look at how educators are using computers.

From conversations with teachers and market researchers, we learned that on average, only three to five teachers in a given school use computers.

"You're kidding," we say. "Only three or four?"

"Hey, that's a dramatic improvement," responds Ann Wujcik, director of educational research at Link Resources' Talmis program in New York. "It was only one teacher about a year and a half ago."

In high schools the computers tend to remain in small clusters: in the computer-science lab, maybe in a business lab, and, if the school is particularly aggressive with computers, in an applications area where computers are accessible to anyone. But in senior high school that adds up to about 25 computers per school—not very many.

And what are those three to five teachers teaching with computers? Programming. Why? Because they think that's what they should teach.

"I don't program myself, but I suppose everybody should learn," says Linda Moriarty, a teacher in Boston, Massachusetts.

"It would be nice to teach everybody to program, I guess, but I don't even program myself," says Jeff Babcock, a teacher in Alaska.

It's time to debunk the myth that everyone needs to learn programming. They don't. Programming basically teaches you how to interact with the machine, not with the world around you. Children should be taught how to use the computer to arrive at some end—whether it's a better-written paper or research that's more in-depth. Learning BASIC is interesting and fun, but we don't believe it helps students function in the larger world.

Interestingly, grade school is where some of that programming myth is debunked.

Possibly, Ms. Wujcik says, that's because teachers don't know what to do with computers in the classroom, and they let themselves think creatively about them. In high school, there's a "correct" way to teach computers, and that means programming.

In any event, in grade school you still find relatively few computers—an average of ten per school building. But those computers tend to be in the classroom instead of a dedicated room. In very aggressive classrooms, as many as four or five computers may be in use. And that's exciting to hear.

But what's even more exciting is that computers are viewed as tools to enhance education. Students use them for drill and practice, tutorials, and simulations. But in the third grade and up children are also being taught something called "process writing"—how to use a word processor to communicate ideas young hands are too slow or clumsy to write. Students may also learn how to use a data base to research information, just as we learned at that age how to use the Dewey Decimal System to glean information from the library.

Remember the fun we had exploring the world once we understood how to make that classification system work for us? We could find books on everything from astronomy to zoology. We felt we were in command of our learning.

We'd guess that most students would like to feel in charge of their learning instead of a computer. That's the difference between using the computer as a link to a world of knowledge and just learning to program.

But it's a difference that's beginning to be understood. Educators aren't rushing out to buy more computers right now, nor are they rushing to buy more software. They're pausing, re-evaluating, and deciding on new directions for computing. We encourage them to move computing in a direction that puts the power of the computer into enhancing education, rather than let it become an end in itself. ■

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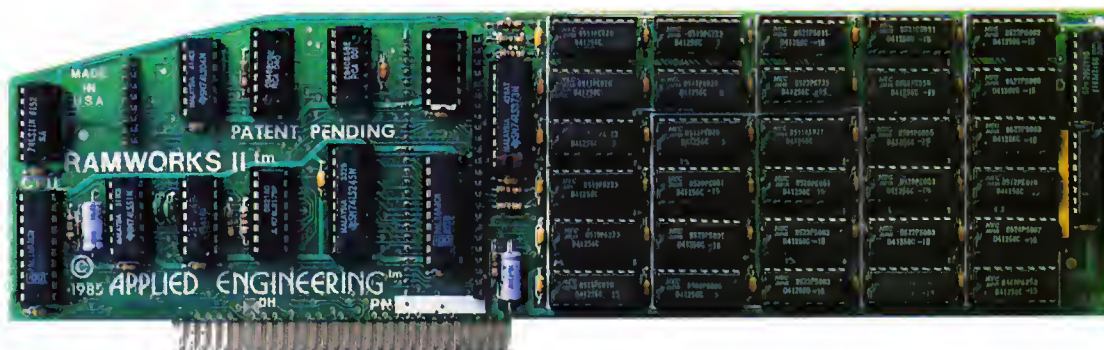
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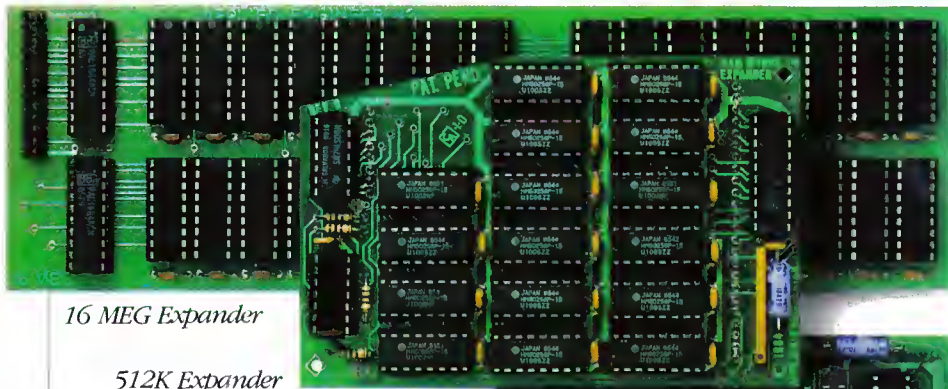
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16 MEG Expander

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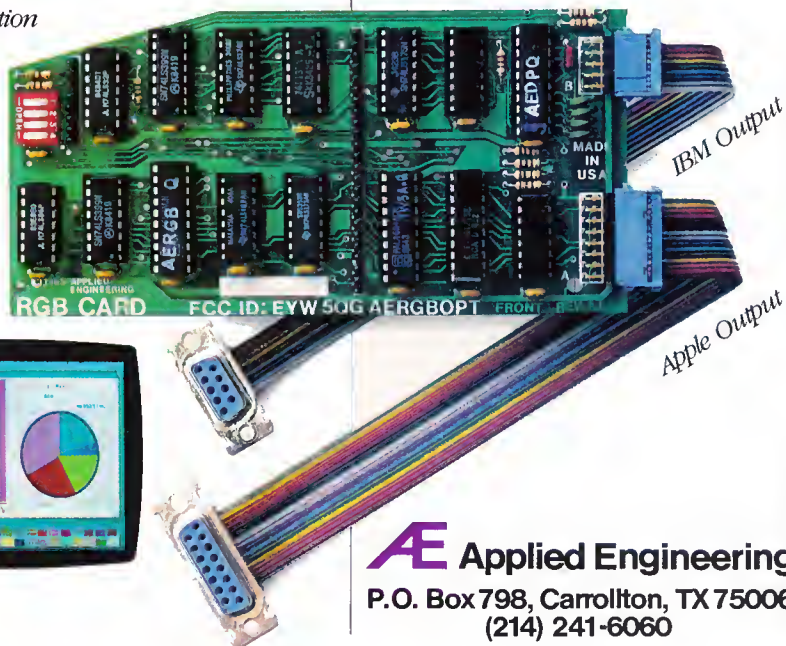


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Apple Aids

I teach physically and multiply handicapped students (ages 5-15) in Georgia. I'm working on a research paper on the use of computers with the handicapped (physically handicapped and mentally retarded). I haven't narrowed my subject yet to the precise topic I'll be researching, so I'm gathering as much data as I can to choose an appropriate area.

If you have any information (bibliographies, reading lists, pamphlets, handouts, and so on) you could send me, I'd appreciate it very much.

Cathy Gambrell
Central Primary School
175 Primary School Road
Carrollton, GA 30117

I was recently contacted by a public-service volunteer asking if I knew of any system, already developed or under development, that would let a blind person use a computer. After searching and researching, I still haven't found anything that would serve the needs of the blind.

I just can't believe this field hasn't been explored. Someone, somewhere, must be developing a synthesized-speech monitor and translator software.

So now I put the question to *inCider*. Can you tell us anything at all about this application? Could you turn Paul Statt loose on this?

Harry R. DeLong
152 Glen Road South
Rome, NY 13440

Fortunately, you're right. Someone has been working on software for the handicapped. Computer Aids (124 West Washington, Lower Arcade, Fort Wayne, IN 46802, 219-422-2424) has developed products that let blind people use Apple computers.

Word-Talk is a word-processing program that enables the visually impaired to create and edit their own documents. It uses synthesized speech and the monitor screen. Text can be read back in full words, lines, or entire screens.

Braille-Talk allows standard text to be translated into accurate, fully contracted braille for embossing. No

knowledge of braille transcription is needed to use this product.

The Prentke Romich Company (1022 Heyl Road, Wooster, OH 44691, 216-262-1984) and Unicorn Engineering (6201 Harwood Avenue, Oakland, CA 94618, 415-428-1626) offer substitute keyboards for handicapped students.

In addition, Access Unlimited (10622 Fairlane Drive, Houston, TX 77024, 713-461-1666) and Adaptive Peripherals (4529 Bagley Avenue North, Seattle, WA 98103, 206-633-2610) also provide a number of special-needs products for physically and developmentally disabled children and adults.

—eds.

Something's Missing

Where is the Right of Assembly column in the March 1985 issue of *inCider*? I hope to see it again in the future.

Walter A. Fay
22210 Bon Heur
St. Clair Shores, MI 48081

Right of Assembly, by Roger Wagner, and Pascal Primer, by Tom Swan, now appear in alternating months. Right of Assembly is included in this issue. Look for Pascal Primer in July.

—eds.

Commendations

I feel that both your readers and the programmers of MicroExpert were done a disservice by the review in your March 1986 issue (p. 74). Apparently, James McKelvey is unfamiliar with expert systems, or he would have realized that MicroExpert has the capabilities of programs that sell for two or three times as much and are only available for 16-bit computers.

Beverly and William Thompson, as well as McGraw-Hill, should be commended for bringing to the Apple user an affordable package that's quite useful for learning about this important new genre of software.

I hope this letter encourages readers to try the program.

Dr. Mark E. Davis
12724 Southwest 119 Terrace
Miami, FL 33186

BBS Hunt

I've been looking everywhere for a bulletin-board program to run on my Apple IIc. I can't seem to locate a company that carries one. I did get a copy of one from a person in Las Vegas, but it was public domain, written for a II Plus, and it didn't work right. Could you steer me in the right direction?

My present system includes an Apple IIc, a Scribe printer, and a Hayes Smartmodem 1200.

Richard L. Winslow
P.O. Box 345
North Haven, ME 04853

See "BBS and Business: A Profitable Pair" in this issue, along with the accompanying Product Information box, for a discussion of electronic bulletin boards and bulletin-board software.

—eds.

Reluctant Robotics

I've been a constant fan of your magazine ever since I bought my Apple II Plus two years ago. After trying unsuccessfully to write programs and communicate with various bulletin boards here in Singapore, I've decided to turn my efforts to miniature robotics. I went to my nearest computer and electronics store only to find it doesn't sell such products.

Well, back to square one. I know many companies in the U.S. sell miniature robotics for computer enthusiasts, but either they're too expensive or the company is too reluctant to deliver them to countries like mine.

My only hope is that *inCider* would have some information for computer enthusiasts like me who want to know about simple model robots and their various applications.

Abdul Halim Latip
Apt. Block 34
Marsiling Drive
06-387
Singapore 2573

In our "Holiday Gift Guide," featured in the December 1985 issue of inCider, we mention the Memocon Crawler (p. 48). It's programmable through your Apple, and sells for \$74.95, from OWI, 1160 Mahalo Place, Compton, CA 90220, (213)

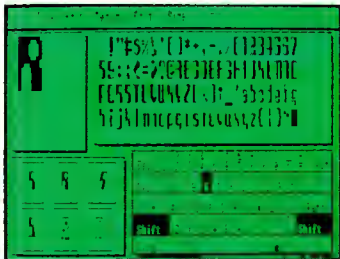
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LETTERS

638-4732. Also listed in the Gift Guide is the Fischertechnik Robotic Computing Kit (p. 51). The kit includes everything you need to build your own computer-controlled robot. It sells for \$199 from Fischer America, 175 Route 46 West, Fairfield, NJ 07006, (201) 227-9283.

Are any inCider readers aware of computer-robotics organizations with which Mr. Latip may be able to get in touch? Let us know. —eds.

Flexigraph Suggestions

I'd like to make a few suggestions regarding the Flexigraph program, by William W. Miller, from the March 1986 issue of *inCider* ("Graphs on the Fly," p. 45).

Dot graphs are nice, but they don't show a complete picture. To produce a line graph (plotting between the points), make the following changes:

- 1) Add line 235 IF T=XL THEN HPLLOT X,Y:GOTO 250:REM This will prevent a retrace from the axes plot.
 - 2) Change the HPLLOT in line 240 to HPLLOT TO.
- 240 IF Y = >0 AND Y = <191 THEN HPLLOT TO X,Y

I'm not sure about the //e, but on my II Plus, functions such as -5.5 result in an error. If you eliminate lines 80 and 120, you can enter positive ranges, and then functions such as LOG(X1.75) will run without error. Of course, if you make this modification, change line 40 to reflect the new "rules."

Kenneth E. Mullenix
2190 NW 74th Avenue
Sunrise, FL 33313

The Supreme Choice

I am neither a hacker, nor do I desire to be one. I merely enjoy the significant benefits of my off-the-shelf micro, and fervently wish to continue to do so in the most efficient manner. Hence, my profound frustration with the vagaries of product compatibility! Your August 1985 issue helps define a case in point.

All indications are that Sorcim's SuperCalc3a (reviewed in *inCider*, August 1985, p. 28) is indeed a super piece of software for the serious number cruncher. The next logical step is a little extra RAM, such as that offered by Applied Engineering (see the RamWorks advertisement, ironically on

page 27 of the same issue), to aid in maximizing the potential of SuperCalc3a. But there are problems with that combination.

To run SuperCalc3a, my Apple //e must be fitted with the "//e enhancement package," whatever that is. Word is, though, that once the //e is so enhanced, it can no longer run the old //e software, or it becomes diminished to the extent that "white-on-black" features become invisible. Must one choose between SuperCalc3a and the rest of the //e library?

Second, Applied Engineering advises that SuperCalc3a, version 2, will automatically access 512K of a RamWorks card. Sorcim disavows any such knowledge. Privately, Sorcim hints that it may come out with a debugged SuperCalc that will access RamWorks.

Isn't there an easier way for us simple folk to upgrade our equipment? Can you help?

Richard A. Yarmey
Canal Square
1054 31st Street N.W.
Washington, DC 20007

We're afraid the only way you can run SuperCalc3a on an Apple //e is to upgrade it with the enhanced chip set (for details, see *inCider*, April 1985, p. 12). An enhanced //e will run most "old" //e software. The major compatibility problem is with inverse capital letters in 80-column mode—instead of letters, you get MouseText characters.

You'll have to decide what you want to do with your computer. If you need the power of SuperCalc3a, you'll have to upgrade your //e. If the software you have now satisfies your needs, don't bother upgrading. Without constantly swapping chips, you can't have it both ways. —eds.

inCider welcomes readers' comments regarding articles, letters, or other topics of interest. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to Letters, inCider, 80 Pine Street, Peterborough, NH 03458.

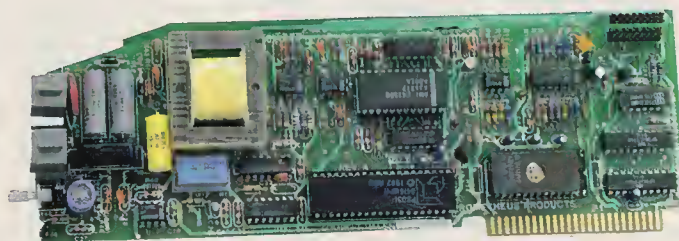
CORRECTION

The phone number for Elsevier Science Publishing is incorrect as it appears in our March 1986 issue (p. 84). The correct phone number is (212) 370-5520.

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| <input type="radio"/> | 1) COMMUNICATIONS |
| <input type="radio"/> | 2) FILE TRANSFER |
| <input type="radio"/> | 3) OPTIONS |
| <input type="radio"/> | USE ESC TO EXIT |
| <input type="radio"/> | ENTER SELECTION |
| <input type="radio"/> | |
| <input type="radio"/> | 1) BAUD RATE 1200 300 |
| <input type="radio"/> | 2) DATA BITS 8 7 |
| <input type="radio"/> | 3) PARITY NONE ODD EVEN MARK SPACE |
| <input type="radio"/> | USE ESC TO EXIT |
| <input type="radio"/> | ENTER SELECTION |
| <input type="radio"/> | |
| <input type="radio"/> | 1) TYPE XMODEM LINE |
| <input type="radio"/> | 2) DIRECTION SEND RECEIVE |
| <input type="radio"/> | 3) FILE NAME |
| <input type="radio"/> | USE ESC TO EXIT |
| <input type="radio"/> | ENTER SELECTION |
| <input type="radio"/> | |
| <input type="radio"/> | 1) PRINTER ON OFF |
| <input type="radio"/> | 2) CLOCK ON OFF |
| <input type="radio"/> | 3) STATUS LINE ON OFF |
| <input type="radio"/> | 4) KEYBOARD ON OFF |
| <input type="radio"/> | 5) CAP LOCK ON OFF |
| <input type="radio"/> | 6) ECHO ON OFF |
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| Advanced Logic Systems | |
| SpellWorks | 29.00 |
| The Handlers (II+, I / e, I / c) | 97.00 |
| Apple Apple Works (I / e, I / c) | 179.00 |
| Apple Writer I / II 2.0 ProDos (I / e, I / c) | 115.00 |
| Quickfile (I / e only) | 75.00 |
| Applied Software Technology | |
| Versatorm I / e, I / c | 48.00 |
| Arays/Continental Software | |
| Home Accountant I / e | 39.00 |
| Home Accountant I / c | 42.00 |
| Tax Advantage 1985 | 37.00 |
| Blythe Software Omnis 3 | 225.00 |
| BPI Systems | |
| BPI General Accounting Dos 3.3 | 194.00 |
| BPI ARA/PIPR or Inv. Dos 3.3 (ea.) | 194.00 |
| BPI General Accounting ProDos | 209.00 |
| BPI ARA/PIPR or Inv. ProDos (ea.) | 209.00 |
| Broderbund | |
| Bank Street Writer or Speller | 41.00 |
| Bank Street Filer or Mailer | 41.00 |
| CBS Software Stockpak II | 89.00 |
| Don Jones Software | |
| Don Jones Membership Kit | 19.00 |
| Electronic Arts Cut and Paste | 22.00 |
| Financial Cookbook | 32.00 |
| First Star The Works | 30.00 |
| Hayden Software | |
| The Writer | 27.00 |
| Human Edge Software | |
| Communications or Management Edge | 27.00 |
| Mind Probe | 27.00 |
| Mind Over Minors | 27.00 |
| Sales or Negotiation Edge | 27.00 |
| Howardsoft | |
| Real Estate Analyzer III w/Tax Preparer | 189.00 |
| International Solutions | |
| MouseBudget | 39.00 |
| MouseCalc | 85.00 |
| MouseDesk | 24.00 |
| MouseWord | 69.00 |
| Intuit Quicken | 49.00 |
| Kensington Microware | |
| Format II Enhanced | 88.00 |
| Living Videotext | |
| Think Tank II+ or I / e | 79.00 |
| Manzanite | |
| BusinessWorks | |
| System Manager (Required) | 65.00 |
| GLAR/AP or Inventory Control | 255.00 |
| Payroll Module | 290.00 |
| The Business Accountant | |
| System Manager (Required) | 69.00 |
| GLAR/AP or Inventory Control | 199.00 |
| Payroll Module | 229.00 |
| The Advanced Business Accountant | |
| System Manager (Required) | 69.00 |
| GLAR/AP or Inventory Control | 259.00 |
| Payroll Module | 295.00 |
| MECCA Managing Your Money | 105.00 |
| Megaheus MegaWorks | 69.00 |
| ReportWorks | 69.00 |
| ThinkWorks | Call |
| Monogram | |
| Dollars and Sense (I / +, I / e) | 68.00 |
| Dollars and Sense (I / c) | 68.00 |
| Forecast (64K or 128K) | 68.00 |
| Noio Press Will Writer | 29.00 |
| Paladin Flashcalc | 59.00 |
| PBI Software Graphworks 1.2c | 59.00 |
| Jeeves | 38.00 |
| Peachtree | |
| Back To Basics: GLAR/AP | 98.00 |
| Pinpoint Publishing Pinpoint | 35.00 |
| Pinpoint Pop-up Spelling Checker | 35.00 |
| PM Software ProFILER 2.1 | 69.00 |
| Practicorp Practicalc II | 26.00 |
| Precision Software SuperBase | 54.00 |
| Quark Catalyst I / e V30 | 59.00 |
| Word Juggler & Lexicheck I / e | 59.00 |
| Roger Wagner Publishing | |
| Mouse Write | 72.00 |
| The Write Choice | 27.00 |
| Satellite Software Wordperfect | 79.00 |
| Sensible Software | |
| Bookends—ProDos | 65.00 |
| Sensible Grammar | 55.00 |
| Sensible Speller—Dos or ProDos | 69.00 |
| Slings On-Line | |
| Homework Plus or Homework Filer | 42.00 |
| Homework Speller | 30.00 |
| Screenwriter Professional | 77.00 |
| Simon & Schuster | |
| JK Lasser's Money Manager | 47.00 |
| JK Lasser's Income Tax | 47.00 |
| Software Publishing | |
| All Programs For I / e With 128K or I / c | |
| PFS: File/Report/Plan/Write | 139.00 |
| PFS: File, Graph, Report | 69.00 |
| PFS: Write or Plan (I / e, I / c) | 69.00 |
| Sorcim/IUS SuperCalc 3a | 99.00 |
| State of the Art | |
| Electric Checkbook | 59.00 |
| GLAR/AP/Inventory/Payroll | 285.00 |
| Stoneware | |
| Slings On-Line | 185.00 |
| DB Master Business Writer | 85.00 |
| DB Master Version Four Plus | 165.00 |

| | |
|-----------------------------------|--------|
| TimeWorks | |
| Silvia Porter's Financial Planner | 59.00 |
| Swiftcalc with Sideways | 105.00 |

Educational Software

| | |
|--|-------|
| Addison Wesley Smart Eyes | 36.00 |
| Apple | |
| Apple Logo I / II 128K (I / e, I / c only) | 79.00 |
| Bantam Books | |
| Fantastic Animals or Road Rally USA | 24.00 |
| The Complete Scarsdale Medical Diet | 24.00 |
| Barron's | |
| Computer SAT Revised Version | 36.00 |
| Brainpower Chipwits or Think Fast | 24.00 |
| Broderbund | |
| Science Tool Kit Master Module | 36.00 |
| CBS Software Adventure Master | 26.00 |
| America Coast to Coast | 24.00 |
| Body in Focus or Dinosaur Dig | 24.00 |
| Forecast! or T-Rex | 29.00 |
| Gore's Bridge | 48.00 |
| Mastering The SAT | 59.00 |
| Success w/Algebra (ea.) | 15.00 |
| Success w/Math (ea.) | 21.00 |
| Davidson & Associates | |
| Alge-Blaster, Classmate or Math Blaster | 27.00 |
| Speed Reader II | 37.00 |
| Speed Reader Data A, B, C, or D | 11.95 |
| Spell-It or Word Attack | 27.00 |
| Designware | |
| European Nations & Locations | 24.00 |
| Grammar Examiner | 26.00 |
| Remember | 42.00 |
| Spellcopper or Spellakazam | 24.00 |
| States & Territories Mission Algebra | 26.00 |
| The Body Transparent | 26.00 |
| DLM | |
| Alligator Mix or Demolition Division | 18.50 |
| Create with Garfield! or Fraction Fuel Up | 18.50 |
| Freddy's Puzzles or Number Farm | 18.50 |
| Spelling Wiz or Word Invasion | 18.50 |
| Fisher Price | |
| Alpha Build or Logic Levels | 16.00 |
| First Man on the Moon | 18.00 |
| Peter Rabbit Reading | 18.00 |
| Grolier Publishing EduCalc | 30.00 |
| Friendly Filer or Easy Graph | 24.00 |
| Science Island or Treasure Hunter | 24.00 |
| Harcourt Brace Computer SAT | 46.00 |
| Learning Company | |
| Addition Magic | 21.00 |
| Bumble Plot or Reader Rabbit | 24.00 |
| Gertrude's Puzzles or Secrets | 26.00 |
| Juggles Rainbow | 18.00 |
| Magic Spell or Word Spinner | 21.00 |
| Moptown Hotel or Number Stumper | 24.00 |
| Robot Odyssey or Rocky's Boots | 29.00 |
| Milliken | |
| Addition or Division Sequences | 21.00 |
| The Milliken Word Processor | 42.00 |
| Mindscape Crossword Magic | 30.00 |
| Keyboard Cadet or Luschier Profile | 24.00 |
| Perfect Score SAT | 42.00 |
| Tink's Adventure, Mazes or Sub. Fair | 18.00 |
| Peachtree/Eduware | |
| Algebra 1, 2, 3, or 4 | 21.00 |
| Algebra 5 or 6 | 26.00 |
| Compu-Read | 16.00 |
| Compu-Math: Arithmetic Skills | 29.00 |
| Introduction to Counting | 19.00 |
| PSAT or SAT Word Attack Skills | 16.00 |
| PSAT/SAT Analogy | 18.00 |
| Spelling Bee w/Reading Primer | 21.00 |
| Writing Skills 1, 2, 3, 4 or 5 | 21.00 |
| PinPoint Micro Cookbook (I / e or I / c) | 26.00 |
| Appetizers, Desserts, Soups & Salads | 11.95 |
| Random House | |

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Modems

| | |
|--------------------------------|--------|
| Anchor Automation | |
| Signalman Express 1200 | 229.00 |
| Signalman Lightning 2400 | 349.00 |
| Volksmodem 12 | 179.00 |
| Apple Computer | |
| Apple Personal Modem | 279.00 |
| Apple IIe/IIc, or Mac Cable | 25.00 |
| Hayes | |
| Hayes Micromodem / Ie | 135.00 |
| Hayes 300 Baud Smartmodem / Ie | 155.00 |
| Hayes 300 Baud Smartmodem | 135.00 |
| Hayes 1200 Baud Smartmodem | 359.00 |
| Hayes 2400 Baud Smartmodem | 575.00 |
| Transet 1000 | 269.00 |
| Novation | |
| Novation Apple Cat II | 189.00 |
| Novation 212 Apple Cat II | 355.00 |
| Novation 212 Upgrade | 219.00 |
| Novation 2400 Baud | |
| Standalone Modem | 479.00 |
| Prentice | |
| Popcom X-100 (1200 Baud) | 245.00 |
| Prometheus | |
| Pro Modem 1200 (External) | 269.00 |
| Pro Modem 1200A (Internal) | 239.00 |
| Pro Modem 300c | 129.00 |
| U.S. Robotics | |
| U.S. Robotics Password 1200 | 199.00 |
| U.S. Robotics Courier 2400 | 389.00 |
| Zoom Telephonics | |
| Zoom/Modem / Ie | 115.00 |
| Zoom/Modem / Ie Plus | 120.00 |

Accelerators/Ramcards/Z-80/80 Col.

| | |
|--|--------|
| Advanced Logic Systems | |
| Add-Ram 16 | 65.00 |
| Add-Ram 80/64 | 52.00 |
| Add-Ram 80/256 | 145.00 |
| Z-Engine 2.2 | 125.00 |
| CP/M Card | 225.00 |
| Apple Computer | |
| Apple II Memory Expansion Card | 225.00 |
| Apple II Extended 80 Col. Card | 115.00 |
| Applied Engineering | |
| RamWorks II (64K to 3MB) | Call |
| Z-Ram / Ie (256 or 512K) | Call |
| Ramworks RGB Option & 16 Bit Option | Call |
| TransWarp Accelerator | Call |
| TrenWarp 16 Bit Upgrade | Call |
| ViewMaster 80 | 109.00 |
| Z-80 Plus | 109.00 |
| Apricorn Apricorn 64K Extend-II | 89.00 |
| Apricorn 16K Ramcard II+ | 68.00 |
| AST Research MegaRamPlus w/64K | 125.00 |
| MegaRamPlus w/256K | 179.00 |
| SprintDisk w/256K | 199.00 |
| Caribbean Computer | |
| Extend 80 | 78.00 |
| Checkmate Technology | |
| Multiview 80/160 | 179.00 |
| Multiram CX (256K) | 149.00 |
| Multiram CX (512K) | 189.00 |
| Multiram / Ie (128K) | 129.00 |
| Multiram / Ie RGB (128K) | 159.00 |
| Multiram / Ie (256K) | 149.00 |
| Multiram / Ie RGB (256K) | 179.00 |
| Multiram / Ie (512K) | 179.00 |
| Multiram / Ie RGB (512K) | 215.00 |
| Z80-80A | 55.00 |
| Greene Gate, Inc. | |
| Filipster-RamCard | 275.00 |
| Information Appliance SwyftCard | 69.00 |
| Micro Sci Micro Sci 80/64e | 69.00 |
| Micro Sci 80/256e | 149.00 |
| Microsoft Microsoft Softcard II | 265.00 |
| MTC MTC Speed Demon | 159.00 |
| Titan Industries Saturn 128K Ram | 175.00 |
| Neptune 80 Col. w/64K | 185.00 |
| Accelerator / Ie | 199.00 |
| Videx Videx Videoterm w/SS Inv. | 178.00 |
| Videx Ultraterm | 189.00 |

Multifunction Cards

| | |
|---|--------|
| AST Research | |
| Multi I/O Clock/Calendar | 99.00 |
| Multi I/O Clock/Calendar/2 Ser. Ports | 139.00 |
| Checkmate Technology Gambit | Call |
| Prometheus VERSAcad | 135.00 |
| Quadram Multicore w/OK | 179.00 |
| Multicore w/256K | 179.00 |
| Extended Multifunction Board (64K) | 159.00 |
| Extended Multifunction Board w/RGB | 189.00 |
| RGB Upgrade | 45.00 |
| Street Electronics | |
| Business Card Parallel | 155.00 |
| Business Card Serial | 135.00 |
| Videx PSIO Dual Function Interface | 135.00 |

Printer Interface Cards

| | |
|--------------------------------------|--------|
| Apple | |
| Apple Super Serial Card | 109.00 |
| Apricorn Apricorn / Ie | 49.00 |
| Super Serial Card | 79.00 |
| Interactive Structures | |
| PK500/U Interface | 115.00 |
| Orange Micro | |
| Serial Grappler Plus | 75.00 |
| Grappler+ | 74.00 |
| Buffered Grappler+ | 135.00 |
| Grappler / Ie | 78.00 |
| Hot Link | 49.00 |
| Practical Peripherals | |
| Graphicard | 59.00 |
| PrinterFace | 49.00 |
| Serial Interface Card | 95.00 |
| Quadram | |
| A-PIC Parallel Interface | 65.00 |
| A-PIC Parallel Interface w/Color Gr. | 75.00 |
| Serial Interface (AB-400) | 71.00 |
| Buffered Serial Interface (64K) | 99.00 |
| Spies Labs Nice Print | 105.00 |
| TextPrint | |
| Print-It! (Parallel or Serial) | 125.00 |
| Thirdware | |
| Finger Print Plus II+ / Ie / Ie | 89.00 |

Clock/Calendar Peripherals

| | |
|--------------------------------------|--------|
| Apple Engineering | |
| TimeMaster H.O. | 99.00 |
| BSR Interface | 39.00 |
| I / c System Clock | 65.00 |
| Practical Peripherals | |
| ProClock / Ie or I / c | 119.00 |
| Quadram | |
| Pro Dos Clock/Calendar Card | 59.00 |
| Creative Peripherals | |
| Seiko Datagraph 2001 w/Time Trax | 149.00 |
| Time Trax / Ie or I / c | 79.00 |
| I / c System Clock | 55.00 |
| Street Electronics Livewire | 70.00 |
| Thunderware Thunderclock Plus | 105.00 |

Video Cards

| | |
|--|--------|
| Color Enhancer / Ie w/Dazzle Draw | 119.00 |
| Color Enhancer / Ie | 89.00 |
| Screen Enhancer / Ie | 89.00 |
| Screen Enhancer / Ie | 49.00 |

Accessories

| | |
|--|--------|
| Kensington System Saver | 60.00 |
| Cool+ Time | 69.00 |
| Curtis Diamond | 30.00 |
| Curtis Emerald | 36.00 |
| Curtis Ruby | 54.00 |
| Curtis Sapphire | 47.00 |
| Pico Products | |
| Tilt & Swivel Monitor Stand/Power Center | 59.00 |
| Touch Window by Personal Touch | 179.00 |
| Apple Mouse / Ie | 115.00 |
| Apple Mouse / Ie | 79.00 |
| Pico Universal Joystick II+ / Ie, I / c | 25.00 |
| Hayes Mach II Joystick | 27.00 |
| Hayes Mach III Joystick | 33.00 |
| Kraft Quickstick / Ie | 49.00 |
| Kraft Joystick | 26.00 |
| Digital Paintbrush System | 175.00 |
| Muppet Learning Keys | 42.00 |
| Koala Pad Plus | 72.00 |
| KeyTronic Keyboard KB-200 | 180.00 |
| Trekhouse Keypad | 79.00 |
| Mockingboard A Board | 115.00 |
| Mockingboard C Board | 65.00 |
| Mockingboard D Board (I / c) | 125.00 |
| Echo II Plus | 94.00 |
| The Crickler / Ie | 94.00 |
| Rainbow Paper Pak (300 sheets) | 12.00 |
| ImageWriter Ribbon-Black | 4.50 |
| ImageWriter Ribbon-Color | 5.00 |
| ImageWriter Rainbow Pak (6 Colors) | 27.00 |
| Environmental Software: Apple Skins | |
| Apple I / c or I / e w/Monitor II Cover | 19.00 |
| Apple I / c w/Color Monitor Cover | 21.00 |
| Apple I / e Professional System Cover | 23.00 |
| Apple I / c, I / e or UniDisk Drive Cover | 7.00 |

Blank Media

| | |
|----------------------------------|-------|
| 5 1/4" Blank Media | |
| BASF 5.25" SS/DD (box of 10) | 10.50 |
| Elephant 5.25" SS/DD (box of 10) | 10.95 |
| Verbatim 5.25" SS/DD (box of 10) | 12.50 |
| Sony 5.25" SS/DD (box of 10) | 12.50 |
| Maxell 5.25" SS/DD (box of 10) | 13.50 |
| Nashua 5.25" SS/DD (box of 10) | 12.50 |
| Memorex 5.25" SS/DD (box of 10) | 13.50 |
| 3M 5.25" SS/DD (box of 10) | 12.00 |
| Dysan 5.25" SS/DD (box of 10) | 19.95 |
| 3 1/2" Blank Media | |
| BASF 3.5" DS/DD (box of 5) | 15.00 |
| Sony 3.5" DS/DD (box of 10) | 29.00 |
| Fuji 3.5" DS/DD (box of 10) | 28.00 |
| Verbatim DS/DD (box of 10) | 31.00 |
| Maxell 3.5" DS/DD (box of 10) | 31.00 |
| 3M 3.5" DS/DD (box of 10) | 29.00 |

Printers

| | |
|---|---------|
| Apple | |
| ImageWriter II Color Printer | 459.00 |
| ImageWriter II 32K Buffer | 79.00 |
| ImageWriter II Cut Sheet Feeder | 175.00 |
| ImageWriter (Wide Carriage) | 475.00 |
| Brother | |
| HR-15XL (20cps) Daisywheel | 309.00 |
| HR-25 (23 cps) Daisywheel | 489.00 |
| HR-35 (35cps) Daisywheel | 729.00 |
| TwinWriter 5 Dual Head Printer | 839.00 |
| Fortis/Dynax | |
| DH45 Dual Head Printer | 839.00 |
| Citizen | |
| 120-D (120cps) W/NLO 10" Carriage | 179.00 |
| MSP-10 (160 cps) 10" Carriage | 239.00 |
| MSP-15 (160 cps) 15" Carriage | 359.00 |
| MSP-20 (200 cps) 10" Carriage | 329.00 |
| MSP-25 (200 cps) 15" Carriage | 489.00 |
| Epson | |
| LX-80 | Call |
| LX-90 | Call |
| FX-85 | Most |
| FX-286 | Recent |
| EQ-800/1000/1500 Low! Low! | Call |
| SQ-2000 | Prices |
| Juki 6000 (10cps) Daisywheel/Par. | 179.00 |
| 6100 (18cps) Daisywheel/Par. | 339.00 |
| 6200 (30cps) Daisywheel/Par. | 509.00 |
| 6300 (40cps) Daisywheel/Par. | 649.00 |
| NEC SpinWriter e.i.f. 360 | 399.00 |
| SpinWriter 2030P (20 cps) | 669.00 |
| SpinWriter 3530P (35 cps) | 779.00 |
| P-660 (216cps) Parallel 10" | 479.00 |
| P-760 (216cps) Parallel 15" | 619.00 |
| P-560 (240cps) Parallel | 1049.00 |
| Okidata Okimate 20 Color Printer | Call |
| Microline 182P | Call |
| Microline 183P | Call |
| Microline 192P | Call |
| Microline 193P | Call |
| Microline 192 Apple | Call |
| Microline 193 Apple | Call |

Panasonic

| | |
|------------------------------------|---------|
| KXP-1080 (100 cps) NLO Mode | 199.00 |
| KXP-1081 (120cps) NLO Mode | 239.00 |
| KXP-1092 (160cps) NLO Mode | 299.00 |
| KXP-1592 (160cps) NLO Mode | 419.00 |
| KXP-1595 (240cps) NLO Mode | 569.00 |
| KXP-3131 (16cps) Daisywheel | 259.00 |
| KXP-3151 (23cps) Daisywheel | 399.00 |
| Silver Reed | |
| EXP-400P (14cps) Daisywheel | 189.00 |
| EXP-500P (18cps) Daisywheel | 189.00 |
| EXP-550P (20cps) Daisywheel | 319.00 |
| EXP-800P (40cps) Daisywheel | 659.00 |
| Ster Micronics | |
| SG-10 (120cps) Parallel | 219.00 |
| SG-15 (120cps) Parallel | 379.00 |
| SD-10 (160cps) Parallel | 339.00 |
| SD-15 (160cps) Parallel | 449.00 |
| SR-10 (200cps) Parallel | 459.00 |
| SR-15 (200cps) Parallel | 585.00 |
| Toshiba | |
| P-321 24 Pin (216cps) Par. 10" | 499.00 |
| P-341 24 Pin (216cps) Par. 15" | 779.00 |
| P-341 24 Pin (216cps) Par/Ser. 15" | 799.00 |
| P-351 24 Pin (288cps) Par. 15" | 1049.00 |
| P-351 24 Pin (288cps) Par/Ser. 15" | 1079.00 |

Disk Drives/Hard Disks

| | |
|---|---------|
| Apple | |
| Apple ProFile (10 Meg) w/Access. Kit | 1139.00 |
| Apple II External Drive | 229.00 |
| Apple DuoDisk w/Accessory Kit | 449.00 |
| Apple UniDisk 3.5 w/Apple II Utilities | 359.00 |
| Apple UniDisk 3.5 w/Catalyst | 385.00 |
| Apple UniDisk 3.5 Accessory Kit (II+ / Ie) | 59.00 |
| AST Research | |
| MicroStor 10MB Tape Backup Only | 939.00 |
| MicroStor 10 MB Hard Disk Only | 939.00 |
| MicroStor 10MB Hard Disk w/Tape | 1449.00 |
| Corvus Systems OmniDrive Hard Disks | Call |
| H & M Disk Drive Services | |
| EquiDisk+ | 599.00 |
| 737K of storage on each Drive! Includes 2.5, 25" Drives w/Controller, Power Supply & Cables. Apple DuoDisk Side By Side Design! | |
| Micro Sci A2 Full Height | 149.00 |
| A5 Slimline / Ie | 149.00 |
| A5 Slimline / Ie | 159.00 |
| Micro Sci C2 Controller | 45.00 |
| Miltec AD-1 Full Height / Ie | 139.00 |
| AD-3C Slimline / Ie or I / c | 129.00 |
| Pico Products | |
| Apple Half-Height II+ / Ie, I / c | 139.00 |
| Turn Apple II+, or I / e, into I / c | |
| Compatible Drive | |
| Apple Disk Drive Adaptor Plug | 14.00 |
| Quark | |
| QC-10 Hard Disk / Ie, I / c or Mac | 799.00 |
| QC-20 Hard Disk / Ie, I / c or Mac | 1119.00 |

Monitors

| | |
|------------------------------|--------|
| Amdek | |
| Video 300G 12" Green Monitor | 115.00 |
| Video 300A 12" Amber Monitor | 119.00 |

| | |
|--------------------------------------|--------|
| Color Monitor 300 (Composite) | 209.00 |
| Color Monitor 600 (RGB) | 385.00 |
| DVM III RGB Interface | 119.00 |
| Apple | |
| Color Monitor / Ie | 289.00 |
| Color Monitor / Ie | 289.00 |
| Princeton Graphics | |
| HX-9 9" RGB Color | 389.00 |
| HX-12 RGB 12" RGB Color | 409.00 |
| RGB-80 Interface | 140.00 |
| Sekata | |
| SG-1000 Green | 105.00 |
| SA-1000 Amber | 115.00 |
| SC-100 Composite Color | 149.00 |
| SC-200 RGB Color | 379.00 |
| SWI International Systems | |
| CVUE Flat-Panel Display / Ie | 389.00 |
| Taxan | |
| 115 12" Hi-Res Green | 115.00 |
| 116 12" Hi-Res Amber | 119.00 |
| 220 14" Composite Color | 209.00 |
| 610 12" Hi-Res RGB Color (510x200) | 345.00 |
| 620 12" Hi-Res RGB Color (640x200) | 385.00 |
| 410-80/64 RGB-II Interface | 169.00 |
| Teknika | |
| MJ-22 RGB Color Monitor | 199.00 |

Ordering Instructions

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To order, call us anytime Monday thru Friday 9:00 to 9:00, Saturday 10:00 to 6:00. For fast delivery if ordering by mail, send cashier's check, certified check or money order. Fortune 1000 & Government checks honored immediately—Personal and other company checks allow 2 weeks to clear. Mastercard & Visa include card # & expiration date. Connecticut residents add 7.5% sales tax.

Shipping Charges: Residents—\$3.00 Minimum charge U.S. Mainland. With C.D.O. shipments add an additional \$2.00 U.S. Postal, APD, and FPO add 3% (\$5.00 Min.). Alaska or Hawaii add 6% (\$10.00 Min.). Canadian orders add 10% (\$15.00 Min.). Foreign Orders except Canada—Add 18% (\$25.00 Min.).

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edited by Wendy Lea McKibbin, *inCider* staff

Report Card

In Apple's report for the first quarter of 1986, John Sculley promised, "If Apple is to stay at the forefront of the personal-computer industry, we must continue to develop and market products that make technological advancements available and affordable to our customers."

Sculley stresses the importance of products in areas like desktop productivity, communications, and publishing to Apple's future. To show he means what he says, Sculley offers us the first-quarter report, typeset with a Mac, pagemaker, and LaserWriter. It's a neat—and a cheap—trick, but the book doesn't have the quality you'd expect from a company with \$441,000,000 in the bank.

That's right. Revenues are up at Apple, even as sales are down. Apple admits on page one of the quarterly report that Apple II sales are responsible for its financial health, then goes on to stress the importance of the Mac market. Strange company.

Quibbling over DOS

Apple DOS licensing continues to be a bone of contention between Apple and its user groups, who dislike being regulated by the same policies that apply to commercial software developers.

In an attempt to ward off software abuse and retain some measure of control,

the company charges an annual \$50 fee for each type of Apple DOS-based volume a user group develops.

Many user groups, though, are either not bothering to obtain a license or are ignorant of the policy, according to an observer inside Apple. The difficulty appears to be aggravation with the red tape more than the sum of money involved, plus an underlying sentiment in the user community that they're "doing Apple a favor" when they comply.

One irate user who wrote to *inCider* summed up his dissatisfaction this way: "While Apple is within its rights under the law to protect corporate secrets, this regulation doesn't sound like the action of a company that's attempting to increase consumer consciousness."

Unofficially, Apple agrees. The company is evaluating site licensing as a way to resolve the problem.

"Alleged Home Market" Finally Appears

Home-computer software made an extraordinary showing in 1985, accounting for 89 percent of the total Apple software sales of the members of the Software Publishing Association. The SPA consists of 51 firms representing a broad range of home, entertainment, and educational software.

According to executive director Ken Wasch of the Washington, D.C.-based SPA group, the home market appeared out of nowhere.

"The home-software market, which was virtually



Ken Wasch of SPA.

nonexistent before 1985, suddenly blossomed and vaulted past educational software during the calendar year," Wasch observes. "No one anticipated that products such as The Print Shop, Dazzle Draw, and The Newsroom would be so enormously successful."

Winners in the home-software market boom for 1985 were Broderbund, Springboard, Spinnaker, Scarborough, Timeworks, and several others.

Besides the home market, other significant areas of growth for Apple software firms included recreational software, operating systems, languages, and vertical-market packages.

Business-software sales were "not significant," and educational-software sales were flat.

It's a Bird, It's a Plane. . .

Apple Computer Inc., the company that began in a garage with the profits from the sale of a VW bus and a pocket calculator, purchased a Cray X-MP/48 supercomputer for a cool \$14.5 million last March to "accelerate new-product development," according to Del Yocam, executive vice president at Apple.

| Financial Highlights | | |
|--|--------------------|-------------------|
| | Three months ended | |
| (In thousands, except per share amounts) | December 27, 1985 | December 28, 1984 |
| Net sales | \$533,890 | \$698,297 |
| Net income | \$ 56,925 | \$ 46,099 |
| Earnings per share | \$.91 | \$.75 |

John Sculley, president and chief executive officer of Apple Computer, Inc., was named chairman of the board by the Company's board of directors on January 28, 1986.

Courtesy of Apple Computer Inc.

Apple says it hopes to maintain a competitive edge against upstarts like Commodore and Atari by using the big computer to "simulate future hardware and software architectures." That means that Apple doesn't need to build a prototype—or pawn a bus and a calculator—every time it considers a new type of hardware or software.

The Cray X-MP/48 is no off-the-shelf computer. Forget the cost; another reason there are only 12 of them in the United States is that the Defense Department loses sleep wondering where they are. The DOD

considers the Cray X-MP/48 a sensitive piece of military hardware. The Soviets have none, and Cray is none too quick to ship an X-MP/48 to Europe.

Yocam says the Cray X-MP/48 "will help us continue to bring revolutionary products to the marketplace." By using a simulation of each new product before building it, Apple will make the revolution less of a risk.

Is It Real?

It's an Apple IIe compatible with 16-color capability, it's lightweight and portable, and it comes with mouse interface, 128K of RAM, 80-column text display, modem interface, and more. It costs less than \$400.

Do you believe it? We're not sure we do, but it's certainly interesting. The product is the Laser 128, and we first saw it at the Consumer Electronics Show in Las Vegas in January.

The Laser 128 is made in Hong Kong by Video



Laser 128, from Central Point Software.

Technology, a Chicago-based company. The U.S. distributor is Central Point Software of Portland, Oregon. The Laser 3000, the company's first product, is compatible with the II Plus. That machine has been available for about a year and is sold primarily through mail order, but it hasn't developed much of a market, observers say.

It did get Apple's attention, though. The company is currently involved with Apple in legal discussions concerning possible patent infringements with the design of the 3000. Apple observers expect the Laser 128 to encounter similar legal problems. But executives at Video Technology say, "We

don't foresee legal problems holding us up."

Laser 128's are imported in 100-lot shipments, and by late March company officials reported "several hundred" had been shipped. Officials say they haven't heard from Apple, but "wouldn't be surprised if Apple had one."

We're always looking for news of the Apple world. If you're making news, send your press releases and photographs to News Line, inCider, 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025.



Courtesy of Apple Computer Inc.

Apple Computer executive vice president Del Yocam.

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APPLE CLINIC

by Jim Sather

Apple Clinic is a forum for discussing Apple II hardware, software, and related subjects. If you have questions or answers or want to make a statement, write to Jim Sather, Apple Clinic, inCider, 80 Pine Street, Peterborough, NH 03458.

More Model Trains

I noted C. de Gier's query (*inCider*, August 1985, p. 106) on using computers with model railroads, and Andy Sperandio's reply (December 1985, p. 101) concerning *Model Railroader's* C/MRI series.

While the *Model Railroader* series is excellent, it describes just one particular system. The group I represent, the Computers in Model Railroading Special Interest Group (CMR-SIG), is a SIG of the National Model Railroad Association. Our purpose is to provide a forum for persons interested in both computers and model railroads. We publish a newsletter six times a year, and membership is not restricted to NMRA participants. Interested readers should send a SASE for information to NMRA CMR-SIG, 8431 Timber Glen, San Antonio, TX 78250.

We support the C/MRI series in the newsletter, along with other control interfaces. Incidentally, the author of the *Model Railroader* series, Dr. Bruce Chubb, is also a member of the SIG. I've enclosed a copy of our newsletter for your information.

Richard F. Dermody
Coordinator, CMR-SIG
San Antonio, TX

I continue to be impressed by the vitality of the model-railroading community. The newsletter I received contains information, schematics, and listings that would interest anyone who wants to interface a model railroad or comparable electrical system with a computer. I've forwarded the newsletter to C. de Gier.

Needs 80-Column Monitor

I recently purchased an 80-column card for my Franklin Ace 1000. The card came with no instructions, so it took me a while to figure out how to activate it. The result is 80 columns of illegible text, with the cursor out of sight below the bottom of the screen.

An article I recently read indicated that my Amdek Color I monitor could be the problem. Unless you can suggest a cheaper alternative, it looks as if I'll have to buy a green monitor or the 64K card to which you alluded in the December 1985 *inCider* (p. 101). Your help would be greatly appreciated.

Ed Cooley
Chester, CT

Indeed, the monitor is your problem. The Amdek Color I is not designed for 80-column text display, and no interface card will make it display 80 columns clearly. Your cheapest option is to purchase a monochrome (not color) high-frequency monitor. You can connect both your color and monochrome monitors to the Apple video output through an RCA male/female/female Y adapter, which you can buy at an audio/video electronics store. You can then use whichever monitor is appropriate.

The best advice for choosing a monochrome monitor is to look at an 80-column display on the monitors you're considering, and judge the clarity for yourself. Besides clarity, important features to look for are a non-glare screen, wide contrast- and brightness-adjustment range, screen size, and the phosphor color of your choice. Accessible horizontal- and vertical-size controls are nice, but not critical.

If the literature accompanying a monitor states that it has medium-frequency response, be suspicious. Since display clarity increases with frequency response, you should buy a high-frequency response monitor. If you're lucky enough to find a computer salesperson who can tell you the actual frequency response of his or her monitors, look for one of 18 MHz (megahertz) or more, though 14-18 MHz would be okay. If you buy one that's less than 14 MHz, ask for free eye drops.

A monochrome monitor is your cheapest (\$100-150) path to clear 80-column text display, but not your only one. You can also purchase an Apple Color Monitor IIe (\$379) or an RGB interface card and RGB color monitor (\$600 and up). Check them out at a computer store, and remember to look at the display before you buy.

BASIC Graphics Problems

I have an Apple IIc and a Scribe printer. When I try to print graphics, the Scribe always prints the most significant bit, even though I'm sending values that are less than 128 decimal. For example, the following program should print one heavy line. Instead, prints the heavy line with a light line below it. Why does the most significant bit always seem to be set?

```
10 PRINT CHR$(4);"PR#1" : PRINT  
   CHR$(27);"n"  
20 PRINT CHR$(27);"V00728" : REM  
   00111000
```

Timothy D. Witham
Ottawa, KS

For those not versed in Scribe graphics programming, line 20 in Timothy's program is supposed to print the vertical-dot pattern represented by the ASCII code for the numeral eight 72 times. ASCII for 8 is \$38, so the vertical pattern should be 00111000, a heavy horizontal line when printed 72 times adjacently.

The problem is that the Applesoft BASIC PRINT statement always sets the most significant bit (MSB) of the text strings it sends to COUT, the character-output routine. Even with PRINT CHR\$(56) in your Applesoft program, CHR\$(184) will be sent to COUT (184 = 56 + 128). One way around this problem is to use seven-point graphics dumps instead of eight. Many commercial programs do this because a few Apple interface cards out there will send only 7 bits, ignoring the MSB.

*Another way around the problem is to relay your graphics patterns to COUT via a short machine-language routine instead of a PRINT statement (see the **Program listing**). The codes LDA \$300, JMP \$FDED stored at \$301-\$306 should do the trick.*

More Graphics Problems

I own an Apple Dot Matrix printer and a Prometheus Graphitti interface card. I'm now attempting to program custom characters. My problem is that I don't know how to send the most significant bit; I'm getting seven-dot patterns instead of the eight-dot patterns I need.

My Graphitti board lets me specify MSB on or MSB off, but I need a card that echoes all 8 bits of any code I send it. Does such a card exist? Also, I'm using an old reference sheet with very meager data about custom character sets. Is an expanded reference manual available for the Apple DMP?

Bruce Hahne
Midland, MI

If you're programming in BASIC, you may have the same problem as Timothy Witham. If so, try the method of relaying printer output described in

Program listing. Relaying printer output.

```
10 POKE 769,173 : POKE 770,0 :  
POKE 771,3  
20 POKE 772,76 : POKE 773,237 :  
POKE 774,253  
30 PRINT CHR$(4);"PR#1" : PRINT  
CHR$(27);"n"  
40 PRINT CHR$(27);"V0072";  
50 POKE 768,56 : CALL 769 : REM  
SEND CHR$(56)
```

*my response to Tim (see the **Program listing**).*

I believe that most interface cards will echo all 8 bits to the printer. You may have to reconfigure a jumper or DIP switch, and you may have to send special MSB-enabling code, like the control-I "H" of the Grappler+. Look through your Graphitti's manual very carefully for this capability. I own a card that has MSB-active jumpers that aren't mentioned in its documentation. You have to be hardware-savvy to figure out what the jumper is for.

If you determine that your card doesn't have 8-bit capability and de-

cide to buy one that does, work with your computer dealer to find the card you want. Most dealers will let you read the documentation prior to purchase, so you can verify that the card meets your needs.

I'm not sure how bad that old manual of yours is, but Apple is pretty good about updating old, inferior documentation. Try writing the company—you might be pleasantly surprised. You also should get your hands on an ImageWriter manual. That book is pretty polished documentation, and ImageWriter control is identical to DMP control in most respects.

CP/M Installation

I've recently purchased WordStar and Starcard (a CP/M card) from Micropro. I'm having great difficulty with the "install" function—providing computer and printer-interface information to WordStar. Does any company perform this installation function for you?

Joseph E. Harbuck
Brundidge, AL

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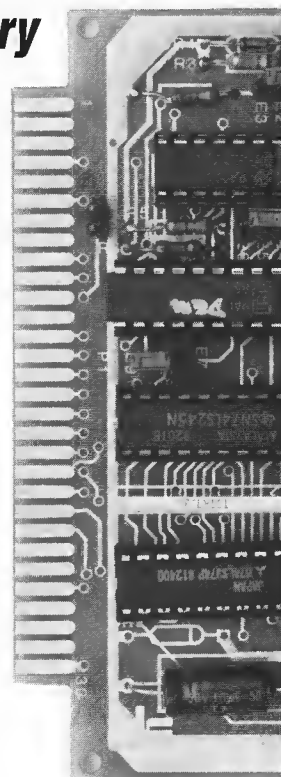
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I talked to the Micropro people, and they don't know of any company that provides the service you request. They suggest you call the Micropro technical support line, (415) 499-8320. The person I talked to warns that the line is very busy, but once you get on, the support people will be willing and able to talk you through the installation.

Micropro also offers a toll-free premium technical service for \$60 per half year or \$95 per year—not expensive compared to a consultant's fee. In fact, it's a real bargain if you need a lot of help.

Apple II Plus Lowercase

I've just installed a switch on the speaker of my II Plus so that I can turn the sound on and off. Is it safe to use the switch while the computer is on, or only when it's off?

Also, I want lowercase capability, but my parents don't want to shell out the bucks to get a IIe. I've heard of different ways to get lowercase on

a II Plus. Can you list them and give some prices?

Ken Blair
Houston, TX

It's probably okay to operate your speaker switch with the power on, Ken. Assuming your switch is wired in series with the speaker, damage to your circuits is unlikely. Of course, I haven't seen your installation, so I can't say for sure.

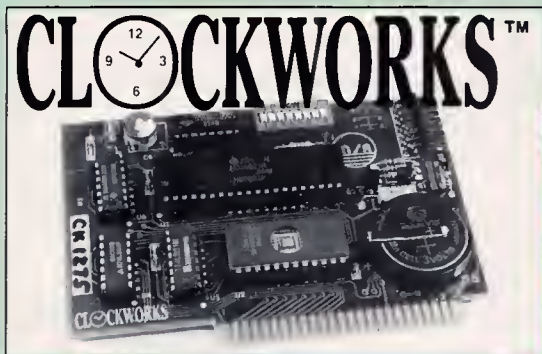
It is better to install a 2500-ohm or larger potentiometer, rather than a switch, in series with the speaker. This gives you continuous control of the computer tooter, from silence to full volume.

I won't list all the ways to achieve Apple II Plus lowercase capability, only the best way. Buy a cheap 80-column card and install the shift-key mod. Go to a computer show or look carefully at computer-magazine ads to locate an 80-column card for less than \$100.

Many programs recognize the shift-key mod for upper- and lowercase

keyboard input. Most Apple dealers will install it for you, or you can do it yourself. It consists of a jumper between the SHIFT' line of the keyboard and the PB2 input to the game I/O socket. If you have a two-board keyboard, install a spring-loaded jumper between pin 4 of your paddle/joystick plug and pin 24 of the exposed pin connector between the keyboard and the little piggyback encoder board. Pin 24 is the second pin from the left as you look in at the keyboard from the back of the Apple.

If you don't have the two-board keyboard, it's best to solder a jumper in. With the power off, remove the keyboard and motherboard from the Apple. Solder jumpers between keyboard connector pin 4 and SHIFT' on the keyboard, and between keyboard connector pin 4 and game I/O-socket pin 4 on the motherboard. If you place the keyboard upside down with the keyboard-connector pins visible at your upper left, the SHIFT' line is connected to the left terminal of switch 53 (switch 51 of the two-board keyboard).



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APPLE CLINIC

Audio Amplifier Connection

I own a Franklin Ace 1200, and have heard that you can attach a small stereo amplifier to the computer to get better-quality sound. Could you tell me an easy way to attach an external amplifier to the computer so I can use a music program without getting an earache?

Todd Blakaitis
Randolph, NJ

I've connected Apples to audio amps before, and been surprised by the improvement in sound. Another benefit is the full volume and tonal control normally built into the amplifier. Unfortunately, you can't simply connect most amplifiers directly to the speaker jack of an Apple II-compatible computer, because one of the jack's pins is connected to +5 volts. The Apple IIc is an exception—it has an external speaker/phone jack you can connect directly to an audio amp.

You could connect an amplifier to the speaker jack through an audio transformer or other adapter, but I've gone about it in a different way. I tap into the audio signal at a point at which it's at a low voltage level with reference to ground. This point is at

the cathode of a clipping diode, which is in the base circuit of the audio amplifier of every Apple II-compatible for which I have a schematic. Diode identification for several computers is given in the accompanying Table.

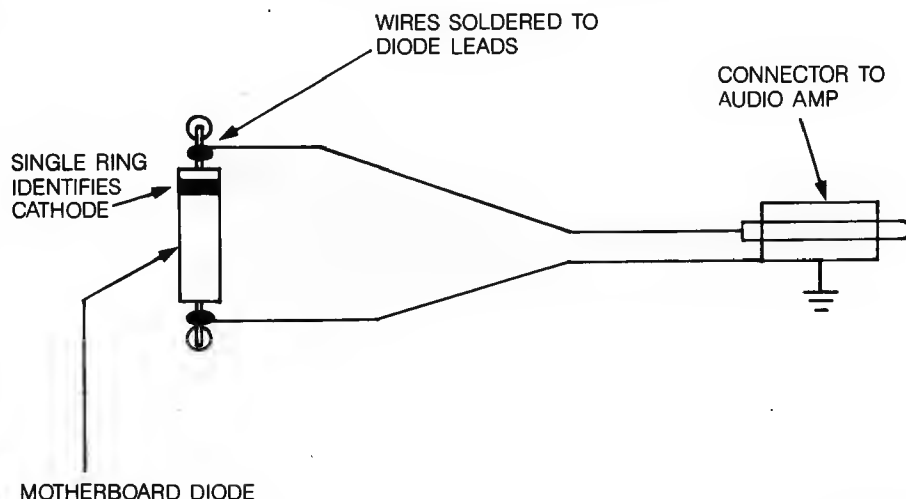
While referring to the Figure, connect one end of a length of twin-lead wire or coax cable to a plug that fits your amplifier's input jack (probably an RCA phono plug). Solder the other end of the wire that's connected to the center pin of the phono plug to the cathode of the motherboard audio clipping diode (a single ring around one end of the diode identifies that end as the cathode). Solder the wire connected to the shield of the phono plug to the other end (the anode) of the diode.

Disconnect the built-in speaker from the speaker jack, turn the computer on, and verify that it operates properly. If the computer won't come on, turn it off immediately and check your wiring. The wires to the diode are probably reversed, shorting +5 volts to ground. Also, if you're using a very old vacuum-tube amplifier with a two-prong power plug, you might have to reverse the power plug in the wall socket.

Table. Identification of audio clipping diode for Apple and compatible computers.

| Computer | Diode | Part Number |
|--------------------------|-------|-------------|
| Apple II/II Plus | CR1 | 1N914 |
| Apple IIe | CR4 | 1N914 |
| Basis 108 | D1 | ? |
| Franklin 1000/1200 | CR1 | 1N914 |
| Franklin 1000/1200 Rev A | CR81 | 1N4148 |

Figure. Computer connection to an audio amplifier.





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—*InCider*, Oct. '85

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—*Computer & Software News*, Nov. 18, 1985

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* Apple IIc or IIe, when used with an RGB interface card such as the Video 7 Color Enhancer IIc or IIe, and others. Check with the board manufacturer for complete compatibility and installation information.

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Applesoft Control Characters

While experimenting with my Apple IIe, I found that I could make the bell sound by including CTRL-G in an Applesoft PRINT statement. I was amazed because I didn't know you could use control characters in BASIC programming. Can you tell me why this happens and if there are other control-character functions?

John Baust
St. James, NY

You can include control characters directly in BASIC strings or REM statements. When you execute or list PRINT "CTRL-G" or list REM CTRL-G, the control character is sent to the primary output-device driver, usually the COUT1 video driver and/or a printer driver.

In Applesoft, you usually use CHR\$() to represent control codes, but you can type the control character directly into the string, as you discovered. PRINT "CTRL-G" gives exactly the same result as PRINT CHR\$(7), but the two statements look

different when listed. Generally, you should use PRINT CHR\$(7) in your programs to make them understandable.

Control characters in PRINT statements have unlimited uses, but three primary ones are video-display control, printer control, and DOS-command identification (CTRL-D = CHR\$(4)). An example of display control is PRINT "CTRL-K" with 80-column firmware active, which clears the screen from the current cursor position. Other COUT1 display control codes are given in Table 3.3 of the Apple Reference Manual for IIe Only and similar tables in all Apple II reference manuals.

Examples of BASIC printer control are given in most printer reference manuals. A favorite of mine is to place a CTRL-N at the beginning of REM statements containing subroutine titles, causing my Epson-compatible printer to print the titles in double width. Another trick is to use properly placed REM CTRL-L statements—they cause most printers to space over the perforations.

65C02 Addressing

The introduction to the Apple Language Card manual states that the Apple II Plus can have only up to 64K of RAM, because that's all the microprocessor can address. If I were to replace my 6502 chip with a Rockwell 1-MHz 65C02 (see the May 1985 Apple Clinic, p. 117), would my computer then have 128K capability? Also, will the Rockwell 65C02 work in my Apple II Plus with all but two slots occupied?

Gilbert Ramirez, Jr.
Houston, TX

Both the 6502 and 65C02 can address 64K memory locations directly. Therefore, all Apple II-family computers were designed with a 16-line address bus (2^{16} equals 65,536 equals 64K). It's a fundamental feature of these computers that the motherboard microprocessor can directly address only 64K.

It's possible to address more than 64K of memory in a 64K machine through bank-switching schemes. The Apple IIe and IIc have RAM bank switching built in—the motherboard circuitry totally supports 64K of motherboard RAM and 64K of auxiliary-card RAM. Through bank-switching circuitry on auxiliary- or peripheral-slot RAM cards, it's possible to access many megabytes of RAM in a II Plus or IIe.

With some simplification, bank switching works like this: A program activates one of two or more banks by accessing a control address on the motherboard, peripheral card, or auxiliary card, typically \$C00X, \$C08X, or \$C07X. Motherboard, peripheral-card, or auxiliary-card circuitry responds to this control access by disabling all but one 64K bank. Then, when the microprocessor addresses one of 64K locations, only the location addressed on the active bank responds.

I haven't received much reader feedback on Rockwell 65C02s, but you'll probably have to try modifications similar to those mentioned in the January 1986 Apple Clinic (p. 107) to make any 65C02 operate in an Apple II Plus.

AppleWorks and UniDisk

Is there a way I can store data to my UniDisk with AppleWorks version 1.2?

Wayne Chamberlin, M.D.
Helena, MT

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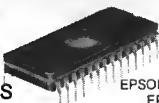
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No, there isn't. Go to your Apple dealer and ask for a free update to AppleWorks version 1.3 (or later, if one is released). Version 1.3 is UniDisk-compatible.

65SC02

I recently purchased and installed the Apple IIe enhancement kit. The microprocessor is marked GTE G65SC02P-2, which I interpret as meaning I have a GTE 65SC02 MPU.

The article in the March 1986 *inCider* (p. 38), "Franklin Clones the IIe," states that the 65SC02 is a close relative of the 65C02. Just how close is it? Did Apple supply the correct processor in the enhancement kit, and will it cause any compatibility problems? Also, the instructions quote part number 342-0304 for the CD ROM, but my new chip is labeled 341-0304A. Should I be concerned?

William G. Tsaronis
Elyria, OH

Everything's kosher, William. Western Design Center, which originally designed the 65C02, calls it a 65SC02. Rockwell and NCR choose to call their versions 65C02, while GTE sticks with the original 65SC02. These are all generally referred to as 65C02s.

There are operational differences between Rockwell 65C02s and NCR/GTE 65C02s. Basically, the Rockwell 65C02 executes a few instructions the NCR/GTE 65C02 doesn't have. Apple has always supplied the NCR/GTE 65C02, so it's unlikely that any commercial Apple programs using the extra Rockwell instructions will be released. Therefore, any 65C02 should correctly execute programs written for the enhanced Apple IIe.

The correct part number for the enhanced CD ROM chip is 341-0304A. To my knowledge, that's the only enhanced CD ROM Apple has shipped.

CP/M and UniDisk

Can Apple's new 3½-inch UniDisk operate in CP/M mode with any Apple equipped with a Z-80 card? Especially, can an Apple IIc equipped with Applied Engineering's Z-RAM card work with the UniDisk?

Daniel Pauly
Manila, Philippines

CP/M wouldn't be CP/M if you couldn't make it work with any I/O device. There are many different Z-80 cards, though, and most of them re-

quire their own version of CP/M—and each version of CP/M must be updated to work with the UniDisk. If the manufacturer of your Z-80 card supplies and updates Apple-based CP/M software as a matter of policy, then a UniDisk version of CP/M is probably available.

If your Z-80 card came without software, you'll have to figure out with which "major" Z-80 card yours is compatible, and obtain an appropriate UniDisk version of CP/M from the same place you got your other versions of CP/M—that is, you'll probably have to borrow it. I don't condone or recommend this; I'm just saying I don't think you can buy open-market versions of CP/M without the Z-80 hardware it was designed to support.

People I talked to at Applied Engineering thought their UniDisk CP/M software for Z-RAM would be ready by May 1986. Contact them if you own a Z-RAM and UniDisk, but lack the correct CP/M software.

Osborne/Apple Compatibility

I own an Apple IIe, and the church I attend uses an Osborne. As I understand it, the Osborne runs CP/M, so I can't use programs for it on my IIe. If I install a Z-80 card in my IIe, would I then be able to use the Osborne's program and data disks in the Apple?

Thank you for any information you can give that will help me understand this situation.

Don Seifert
Maple Valley, WA

Even though CP/M is designed to be a standard system, no force in the universe appears capable of making computer manufacturers standardize disk hardware. The built-in Osborne disk drive and the Apple Disk II/controller combination are incompatible. Furthermore, I know of no Osborne-compatible drives and controller commercially available for the Apple. Even with a Z-80 card installed, Apples and Osbornes still can't read each other's disks. ■

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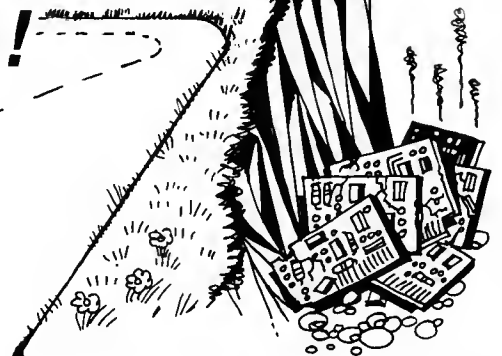
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†Note: CP/M, Pascal and PFS:Write-DOS versions do not suggest correct spelling of words or allow immediate correction of misspellings.

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REVIEWS

Flipster, Kache Board, Voice Master, The Works!,
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Dedicated RAM

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| | |
|---------------|---------|
| Ease of setup | ■ ■ ■ ■ |
| Ease of use | ■ ■ ■ ■ |
| Documentation | ■ ■ ■ |
| Support | ■ ■ ■ |
| Overall | ■ ■ ■ ■ |

Cirtech products are distinguished by excellent hardware and competent support software, and the Flipster is no exception.

The Flipster is a 1-megabyte expanded-memory card for the Apple II Plus and //e. You can configure it for up to four independently bootable, partitioned storage devices (a smaller-RAM version of The Sider, if you will). It's not an extended-memory card that increases your machine's usable memory.

Dedicated Work Areas

Start by booting the Flipster's file-management software. When you first access the Flipster, the screen asks you the number of work areas you want to create. Any number between one and four is valid, and the Flipster will partition its 1 megabyte of memory accordingly. From then on, you can dedicate any of the work areas to a particular application.

After you choose a number, the software displays the main operations menu. You can select, restore, back up, or clear any of the work areas. Select and name one of the areas, then place a bootable application disk in your drive, and press the return key.

That's phase one of the Flipster's operation. While you're running an application, the Flipster appears as a large disk drive (up to the partitioned size for ProDOS, CP/M, and Pascal, but not larger than 800K—two 400K drives—for DOS). You can repeat the procedure for any of the four supported operating systems, or use the same operating system for all the work areas you've created.



When you're ready to exit the current work area, press control-open apple-reset and type PR#<<n>> (<<n>> being the number of the slot in which you've installed the card). You can install the Flipster in any slot, but slot 7 is preferable. In this slot, you auto-boot from the Flipster when you press control-open apple-reset, rather than use PR#<<n>>. You then continue from the operations menu.

Booting Up

An alternative approach is to use the Flipster's work areas as boot drives for nonprotected software. Instead of placing an application's boot disk in the floppy drive, use a disk containing just the operating system under which the application runs. Once in the operating system, format the Flipster's current work area and copy the application software (plus any system files for ProDOS or Pascal) into it.

Whenever you warm-boot your Apple and select a work area, the Flipster takes you to a RAM disk with the application you've copied to it (without reverting to floppies). If the application normally runs when you boot its disk (perhaps from a HELLO program or SYS file), it will automatically boot from the Flipster.

Flipster is fast, as you might expect from a RAM device. And by alternating applications, you can cut down on disk-access time. When you warm-boot into a new work area, though, you effectively terminate any application you've left in another area. This isn't a concurrent system.

Flipdisks

A third possibility is to simply use the Flipster without the file-management software. ProDOS recognizes the card automatically, and support software Cirtech provides makes it DOS-, Pascal-, and CP/M-compatible (Softcard or Cirtech CP/M systems only).

The back-up option from the main operations menu lets you create "flipdisks" of the contents of a particular work area. When you turn on your Apple, you can then restore the programs and data to a work area with

inCider's Ratings

| | |
|---------------------|---------|
| Excellent | ■ ■ ■ ■ |
| Above average | ■ ■ ■ |
| Good enough | ■ ■ |
| Not up to standards | ■ |
| The empty set | □ |

Flipster's main menu, instead of the lengthy booting and copying process just described.

DOS, Pascal, and ProDOS 1.1.1 and up work correctly, but early versions of ProDOS seem to produce an interesting anomaly when you run them from a Flipster work area. In theory, the Flipster's file-management software protects the boundaries of the work areas you've created, yet ProDOS insists you have 1 megabyte in which to work.

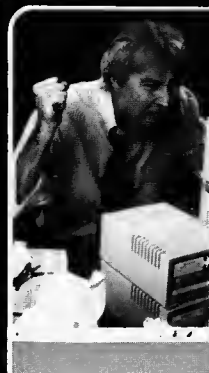
Fortunately, the file-management

software does its job—you can't overwrite other work areas—but the free-space display is misleading. If you bypass the Flipster card, though, and boot directly from a ProDOS disk, you void the boundary protection.

Overall, at \$399, the Flipster is a sight cheaper than buying a disk drive (even the UniDrive), and a whole lot faster than any floppy or hard disk I've yet seen.■

Bill O'Brien
Fort Lee, NJ

Editor's note: According to Ken Swenson of Ampro, Ltd., the Flipster is compatible with the Franklin Ace 2000. "This compatibility offers Franklin Ace 2000 owners who use AppleWorks an increased desktop. The board expands the Franklin's memory to 838K with AppleWorks in memory, and 1012K when AppleWorks is not in memory," Swenson says. He adds that on the back of the program-manager disk is a software patch for AppleWorks version 1.3. Earlier versions don't require a patch. For more information, call Ampro's toll-free number, (800) 828-3399. According to John Robertson of Cirtech in Edinburgh, Scotland, "The Flipster documentation has been rewritten and expanded—it's about three times as large now."



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Support ■■■■■

Overall ■■■■■

One look at the price tells you that not everyone will want a Kache Board. Actually, not everyone needs one, and not everyone who needs one can actually use it. If that isn't cryptic enough, even the board's function might be unfamiliar to you, although the name tends to give it away.

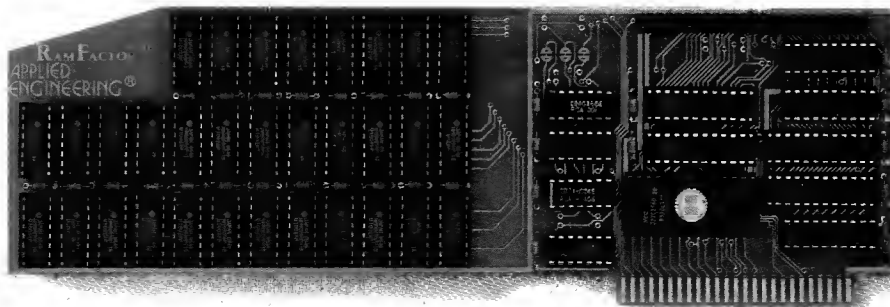
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- Built-in RamDrive™ software (a true RAM disk not disk caching)
- Systems are directly bootable from RamFactor if desired
- Built-in linear addressing 16 bit co-processor port
- Built-in self diagnostic software
- Automatic expansion with AppleWorks 1.3 or later
- Allows Apple II+ and IIe to run your AppleWorks without buying additional software
- Accelerates AppleWorks
- Displays time and date on the AppleWorks screen with any ProDos clock
- Fits any I/O slot except slot 3
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All the leading software is already compatible with RamFactor. Programs like AppleWorks, Pinpoint, BPI, Managing Your Money, Dollars and Sense, SuperCalc 3A, PFS, MouseWrite, MouseDesk, MouseCalc, Sensible Speller, Applewriter IIe, Business Works, ReportWorks, Catalyst 3.0 and more. And RamFactor is fully ProDos, DOS 3.3, Pascal 1.3 and CP/M compatible. In fact, no other memory card (RamWorks excepted) is more compatible with commercial software.

AppleWorks Power

There are other slot 1-7 cards that give AppleWorks a larger desktop, but that's the end of their story. But RamFactor is the only slot 1-7 card that increases AppleWorks internal memory limits, increasing the maximum number of lines permitted in the word processor, and RamFactor is the only standard slot card that will automatically load AppleWorks into RAM dramatically increasing speed and eliminating the time required to access the program disk, it will even display the time and date on the AppleWorks screen with any ProDos clock. RamFactor will automatically segment large files so they can be saved on 5¼", 3½", and hard disks. All this performance is available to anyone with an Apple IIe or II+ with an 80 column card.

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access times with your hard-disk work. DMA techniques bypass byte-by-byte transfer of information in favor of block transfer. For a brief instant, a DMA device takes control of the Apple's memory and literally dumps data into it all at once.

The term *cache* means "hiding place." Its use in computers refers to adding subliminal memory. The Kache Board contains 256K of RAM usable as cache memory. As you request information from your hard disk, it's loaded into cache memory, then into the Apple.

This two-step process may seem unreasonable, but the Kache Board also includes software in ROM that makes it intelligent. It tries to anticipate your disk requests. If you open a data file, it might read in more of the file than you asked for, waiting for your next read assignment. If you're looking for disk free space, that information might be immediately available, having already been extracted from the disk during the last access.

When you combine cache memory

with direct memory access, you're looking at an overall 25 to 30 percent decrease in access time. Considering the already-low access times you achieve with hard disks in general, that figure approaches the virtual-memory environment found in mini-computers such as the VAX.

The Kache Board has relatively few IC's (only eight memory chips, two PROMs, a Z-80 CPU, and two controller IC's) socketed on the component side. On the solder side, though, it's peppered with surface-mount devices. These reduced-size IC's allow greater device density—and the corresponding increase in power the board demands (about as much as a Videx video board). But the \$695 price also includes a separate power supply for the Kache Board. Although Ohio Kache Systems indicates the power supply isn't necessary, it will be in any system that would use a Kache Board. (Using the power supply requires that you cut a small jumper on the Kache Board. It's a simple procedure and very well documented.)

Buying the board presupposes you have a hard disk with which to use it. In general, any hard disk that uses SCSI communications standards is compatible. Apple's ProFile doesn't, Quark's QC10 and QC20 don't, and the Corvus OmniDrive doesn't. They all use a serial communications interface.

The Sider is different. It uses a parallel data-transfer interface (apparent from its 50-pin connector). In fact, the Kache Board and The Sider have been tested together quite effectively. The Kache Board replaces The Sider's controller card and boot menu with one of its own. Even the installation procedures (supplied on floppy disk) are strikingly similar. The board supports DOS, Pascal, ProDOS, and CP/M.

Even with The Sider's low price, the combination of the two parts makes for an expensive whole. If you're not what's commonly called a "power user," the Kache Board will do nothing significant for you except empty your wallet a little faster. But if you depend on fast or repeated disk access, you might want to pay some attention to this product. ■

Bill O'Brien
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and being greeted with "Good morning, Steve," has always fascinated me. Now Voice Master, from Covox, can be taught to recognize and respond to your spoken commands. It also features digitized speech recording and playback.

The Voice Master unit is encased in a small metal box about the size of a thick pack of three-by-five-inch index cards. Controls are sparse but sufficient—there's a small hole for calibration adjustments and a knob for gain/volume control. The unit has jacks for a microphone, an earphone, and a Sound Master circuit board (sold separately). Sound Master offers improved speech and music output (compared to what you get through the Apple's internal speaker) and can be connected to a II Plus or IIe.

The Voice Master headset has an easily positioned miniature microphone and a single padded earphone, like the ones on popular Walkman-type radios. It's tight but comfortable, and although it chains you to your Apple, it doesn't notice-

ably restrict your freedom of movement within that area.

Voice Master is connected to your computer through the game port via a nine-pin plug—II Plus owners will have to purchase a game-port adapter to be able to use it.

When you first boot the disk that comes with Voice Master, a loader program takes over and determines whether you have 64K or 128K, and whether a Sound Master is connected. It then installs the appropriate Voice Master machine-language modules. Your Apple announces "Covox Voice Master," and gives you instructions for calibrating it. (Generally, once you calibrate the Voice Master, you don't need to do it again.)

A demo menu lets you try out the Voice Master features. It includes options for a general demo (recording and playback of speech, voice recognition, variable-speed speech playback, and a spectrum display that varies according to speech input), a talking clock, two talking calculators (one that speaks each key pressed

and another that responds to voice input), a voice-recognition demo that changes the color of the screen to match color names you speak, a blackjack game, and a music-creation and playback program.

The demos are an excellent introduction to what Voice Master can do. They're not flashy, and they're a quick way to learn about the unit—even if you haven't read the manual yet. Although it's designed to work with any Apple II computer, II Plus owners will have to add a lowercase adapter to be able to read many of the demo instructions. Even without the adapter, I was able to quickly check out all the demos, except the blackjack game.

Programming for Speech Recognition

Except for the demos, all the work you'll do with Voice Master must be in Applesoft BASIC. By adding special ampersand (&) commands, Covox has extended BASIC to include a small set of voice-training, recognition, and playback commands. For instance, a program statement that uses the keyword &TRAINn (where n is a number between zero and 31) gives you a chance to speak into the microphone and record a word or short phrase. You can enter a maximum of 32 words or phrases this way. Using &RECOG later in a program will compare the next word or phrase you speak with all previously "trained" words and phrases. The result of the comparison will be deposited in memory location 25. By including a PEEK(25) in the program, you can determine if the words you spoke were matched correctly.

Some of the other new commands include &TPUT and &TFIND (saving and loading trained words to disk), &BLANK (eliminating previously trained words), &RESET (clearing the present vocabulary from memory), &LEARN and &SPEAK (recording and playing back a recorded word), &SPEED (altering the speed of playback), &PAUSE (setting delays between words during playback), and &SAMPLE (setting the sampling rate when learning/training words).

The manual includes several small program segments illustrating new commands, and you can list and study all the demo programs. Covox has promised to send an additional disk of sample programs (unavailable at the time of this review) to all registered Voice Master owners.

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"There are huge differences among the AppleWorks modifying programs sold with the cards. Without doubt, RamWorks II is the most powerful."

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As you can see, it's easy to tell who sets the pace in Apple memory expansion. In fact, if you read the competition's ads, you'll notice that many even claim to be as good as RamWorks. Some say they're "RamWorks compatible".

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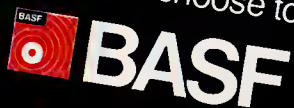
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REVIEWS

"Voice Master is reasonably priced and a lot of fun to use."

The speech that comes through the Apple's built-in speaker is recognizable, but not of very high quality—imagine a tape recording made underwater and mixed with a dose of "white noise." If you're expecting the robotic voice you've heard demonstrated on many other speech devices, you'll be disappointed. The manual states that the Sound Master board (though not yet tested) will improve the speech quality, so if you're anticipating any serious work with the Voice Master, you should check out this additional board.

Without any special effort, Voice Master routinely recognized between 80 and 90 percent of the words I attempted to teach it. By blanking and retraining the unrecognized words, you can easily bring this number closer to 100 percent. Apparently, the key is to be sure to speak in your natural voice. Tone and inflection during the "training" phase are critical. If your voice rises at the end of a word (as if you were asking a question), the program probably won't recognize the same word if you speak later with a flat voice.

Voice Master is reasonably priced and a lot of fun to use. A good working knowledge of BASIC is required. If you haven't gotten very far into programming yet, purchasing a Voice Master may provide that final push to get you going. ■

Steven Schwartz
Framingham, MA

Editor's note: Voice Master has been redesigned since this review was written. According to Brad Stewart of Covox, the new version requires no calibration, and a lowercase adapter is no longer necessary to use the product with the II Plus. The software has been improved, also: Tone and inflection during "training" are reportedly not as critical—voice recognition is more flexible and more accurate, according to Covox. Stewart points out that Voice Master also includes music capability—the Voice Harp Composer—which was not reviewed here.

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If you're reluctant to shell out the heavy cash required for all this, if you'd rather spend your time *doing* instead of *learning*, take heart. There's a way to get all these applications in a single package, one that's fun, easy to learn and operate, and surprisingly powerful. Even better is the price—a paltry \$50. It's called *The Works!*, and, despite some obvious limitations, it might be worth more than just a second look.

The package consists of a single floppy disk and a clearly written 78-page manual. It runs on any Apple II with 64K of RAM. The program is copy-protected, but you can purchase a backup by mailing proof of purchase and \$4 to First Star Software. Should the disk fail within the 90-day warranty period, the company will replace it free; after 90 days, a replacement costs \$7.

The Lineup

Once past the title page, the main menu comes into view, a hi-res animation routine (with sound effects) that illustrates the four groups of program modules: Tools, Arts, Learning, and Organizers. It's cute the first time you see it; after that, it's annoying. Under Tools you find Letter Writer, Loans & Investments, Calculator, Weights & Measures, and Math Formulas. Arts includes Graphics Painter and Music Composer; Learning has Typing Teacher and Math Races programs. Organizers contains Family Finances, Calendar Pad, Address Book, and Stock Portfolio. You can run any one of the 13 programs by highlighting its name (via the arrow keys) and pressing the return key.

When you make a selection, five horizontal bars appear at the top of the screen. In descending order, these bars display the date (which you can set by pressing D), the name of the program, a list of available options, a brief description of the option currently highlighted, and additional instructions, if necessary. If you need it, you can get help by pressing escape-H at any point in any program; this opens a Macintosh-like window in which relevant command information scrolls upward.

Without question, Letter Writer is the heart of *The Works!*. While it's hardly a full-featured word processor, it does offer word wrap, search and replace, and block move, copy, and delete. The arrow keys move the cursor one character at a time in any direction; control-T and control-B move it to the top or bottom of the screen page. Since text is displayed in 40 columns, moving through long documents takes time. Letter Writer holds about 15 screen pages of text—roughly six double-spaced pages printed at 80 columns. You type in text in continuous-insert mode only; to remove the character at the cursor, press the delete key or control-D. Embedding control codes in the text lets you activate printing enhancements such as underlining or boldface, as well as set left, right, top, and bottom margins.

A nice feature is the ability to open a window and merge information—an address or calculation, for example—from another program. You can't access the Graphics Painter and Music Composer programs via the window option, nor can you use it to view or merge text from another Letter Writer file. Another problem is that Letter Writer documents are saved as

MultiRam™ RGB

*The //e Memory Card That
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MultiRam™ RGB's standard features
include an exclusive 10 year
battery backed RAM port,
up to 1 Megabyte of RAM
expandable to 4 Megs,
RGB Video,
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The MultiRam™ RGB Card offers more standard features than any other //e auxiliary RAM card, features simply not available with other RAM cards or available only as expensive options.

The Hardware

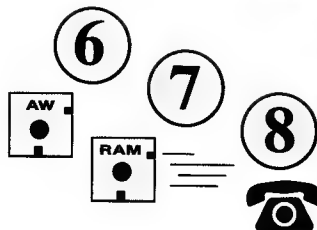
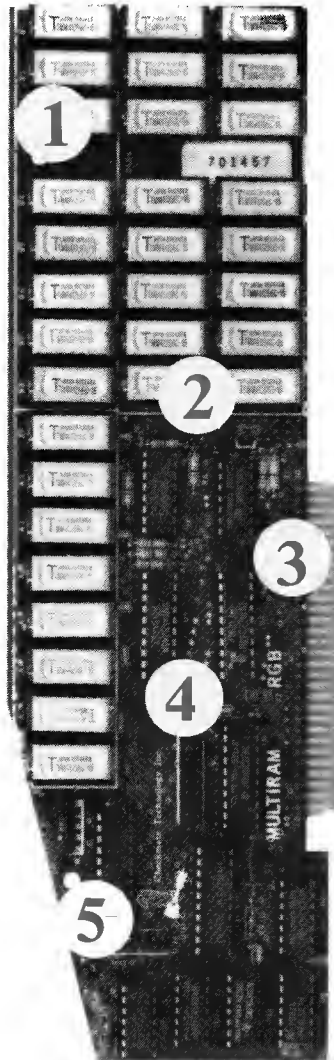
1. With 1 Megabyte capacity, MultiRam™ RGB is available in sizes from 64K to 1 Meg. Plug in your own 256K or 64K dynamic RAM when you need more memory. Then use our sophisticated, unique hi-res RAM test to show the exact location of any bad RAM on the card while testing. Apple Computer says it's the best RAM test available for any memory card.

2. The SRAM Port can be connected to an optional SRAM Pack containing 128K to 2 Megs of Static RAM with 10 year battery backup. Shut off the Apple and all programs and data in SRAM will be there when you turn on the Apple tomorrow. Or next week. Or next year. The SRAM option makes MultiRam™ RGB the only //e memory card that remembers what was stored in it when you turn off the Apple. SRAM Pack options will be available later this year. MultiRam™ RGB is the *first and only* Apple RAM card to offer the SRAM port.

3. Expand MultiRam™ RGB up to 4 Megs using the **memory expansion pins** on the card's back. Add a ¾ Meg MultiRam™ //e card for a 1¼ Meg total. Or add a 3 Meg MultiRam™ Plus card for a 4 Meg total, the most memory available in one slot for the Apple. Because either expansion card fits on the RGB's back (the power supply side), they never touch or interfere with cards in slot 1, another exclusive MultiRam™ feature.

4. The 65C816 CPU Port allows the MultiRam™ EX 65C816 card, a 16-bit option, to directly address all memory on the MultiRam™ cards without bank-switching. Advanced 16-bit software, like VIP Professional, a Lotus 1-2-3 compatible spreadsheet, can use this memory for power spreadsheets. Another MultiRam™ exclusive.

5. The RGB Video connector links the card to any Apple compatible RGB monitor for crisp, vivid 80-column and double hi-res displays. RGB video is standard with the card, an option others charge hundreds for. Of course MultiRam™ RGB also provides you with regular 80-column and double hi-res graphics because it's a direct replacement for the Apple extended 80-column card.



The Software

6. AppleWorks expansion software is included with MultiRam™ RGB to expand AppleWorks from 55K to 3,034K, the largest Desktop available. AppleWorks expansion software lets you • automatically segment and save large files to floppy • load all or parts of AppleWorks into RAM (even printer routines) for supercharged speed • easily use a RAM disk along with an expanded Desktop to store Pinpoint and Jeeves accessories for immediate response • create databases of more than 23,000 records vs the ordinary 1,350 records • create word processor files over 5,000 lines (more than 100 pages) • and show date and time on screen with any ProDOS clock and enter them into databases with one keystroke. And we're adding new features all the time.

7. RAM Disk software for ProDOS and DOS 3.3 is included with the card. Programs are also included to partition and customize the RAM disks as well as to quickly copy files to and from the immense, lightning fast RAM disk (20 or more times faster than floppies) that can be created from MultiRam™'s memory. Pascal and CP/M RAM disk software is available at nominal cost.

The Service

8. We don't forget you after you buy. **Customer Support** is as important a MultiRam™ feature as any other. Get **free** software upgrades from your dealer as we improve our software. Call us on our Customer Support line if you have a question, to see what new programs support more memory, or to tell us your suggestion for improving our hardware or software. We listen to you. We respond. MultiRam™ RGB is just one example of what we do when we listen!

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Interlude II

A BED OF ROSES—INTERLUDE #136

Why did you bring me so many roses?

It was Interlude's idea.

Oh?

Imagine lying in a bed of roses...

Sounds a bit thorny.

Just the petals, darling...cool, velvety, fragrant.

Oh. Oooooooh.

Interlude II. The long-awaited sequel to the first adult computer game in history is finally here. It's provocative and playful! Outrageous and romantic! It has all the excitement of the original Interlude, plus significant new features.

The computerized interview, which is taken by one or both players, has been greatly expanded. It probes your innermost desires to discern your mood of the moment, your secret longings, your special fantasies, and then suggests for your pleasure one of its more than 160 Interludes. You can ask the computer for an Interlude for now, or one for later.

Special options give each player added control over surprises and special erotica hidden in the Interludes.

Six years ago the original Interlude took the computer world by storm, creating a media sensation:

FORUM Magazine: "The Interludes are imaginatively and sensitively written...the computer's recommendations are uncannily appropriate."

US Magazine: "The most edifying third party to join couples between the sheets since The Joy of Sex."

Chicago Tribune: "This marriage of computer technology and sex is natural...erases forever the image of computer-users as dull guys with slide rules in their pockets and square roots on their minds."

Money Magazine: "Sometimes it's easier to tell a computer what you want than it is to tell your partner."

Interlude II will take you to the outer limits of fantasy and romance. And, if the computer selects Interlude #99 your love life may never again be the same.

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Available for Apple II, II+, IIc and IIe.¹

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\$ 39.95 Interlude II
• Shipping (\$3.00 or \$10.00 outside U.S.A.)
• TX residents add 6½% sales tax—\$2.45
\$ _____ TOTAL

binary files, not ASCII text. This means that a "real" word processor, which you'll probably need sooner or later, can't read the documents you create with The Works!.

The Extras

As for the other programs that make up The Works!, here's a brief rundown.

Loans & Investments figures periodic payments, calculates interest, determines future values, and charts annuities.

Calculator lets you add, subtract, multiply, divide, raise to a power, find sine, cosine, and tangent, compute square roots, and send the results to the calculator's memory or your printer. It's handy, but you probably already have a pocket calculator.

Weights & Measures gives you six conversion categories: linear, square, cubic, volume, weight, and temperature, each of which contains a list of appropriate units of measurement. Select a category, type in a value, and Weights & Measures instantly performs the conversion. It's helpful in the kitchen.

Math Formulas computes solutions to simultaneous equations with two or three unknowns, solves quadratic equations, and calculates the sides of a right triangle. Algebra and geometry students will love it.

Family Finances keeps track of expense and income by category, date, or your own three-character code. Type in date, amount, type of transaction (cash, check, or credit card, for instance), category (income versus expense, plus another identifier), name of the person/company you paid or from whom you received money, and a brief description. Once you've saved it to a data disk, you can search this information, scan it, modify or delete it, and selectively print it in any of several formats.

Calendar Pad lets you type in and file information by date, title, number, or color. While it's intended to be an appointment secretary, you could also use it to organize research notes.

Address Book is your basic electronic Rolodex. Records consist of nine data fields (title, last name, first name, street, city, state, zip, phone, and remarks). Once you've created them, you can selectively search, amend, delete, or print them as three-line mailing labels or as a standard telephone-and-address directory.

With Stock Portfolio, you type in transactions, update daily closing quotes, and produce reports on cur-

rent and past holdings. The program automatically revises totals, calculates profit and loss percentages, and provides annual yields for comparison or tax purposes. Summary reports are available for both current portfolios and stocks you've sold; you can generate them for one company, all companies, or the entire portfolio.

With Graphics Painter, you can doodle on the hi-res screen, plant a "seed" graphic the program uses to generate kaleidoscopic effects, save

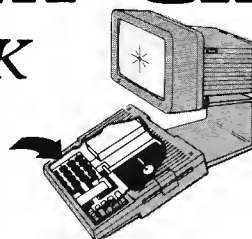
patterns and screens, and move graphics between hi-res pages. There's no provision for screen dumps—one of Graphics Painter's many shortcomings. Dazzle Draw it's not.

Music Composer is a simple utility offering two octaves and no-part harmony. Typing Teacher tests your speed with either random or user-generated text; you can specify various keyboard sectors and set speed goals and word length. Math Races offers integer or decimal practice in the

Continued on p. 98.

MultiRam™ CX

Adds 256K or 512K
to your Apple IIc
for under \$260!



The **MultiRam™ CX** memory card fits inside the IIc, just under the keyboard. Installation and testing require only a screwdriver and few minutes time. Using the big memory of the **MultiRam™ CX** is just as easy as installing it.

Expand your AppleWorks Desktop and file sizes to a possible 425K. But



MultiRam's™ AppleWorks expansion software (included with every card) does more for

AppleWorks than just add more memory. It also:

- Automatically saves and loads files larger than one floppy disk to multiple disks
- Loads all or parts of AppleWorks into RAM (even printer routines) for supercharged speed
- Uses a large RAM disk along with an expanded AppleWorks
- Creates 23,000+ record databases versus the standard 1,350 records
- Creates 5,000+ word processor line files (more than 100 pages) versus the 2,250 line standard
- Shows the date and time on screen with most IIc clock cards
- Enters the date and time into database fields with 1 keystroke

And we're adding more features to AppleWorks all the time.

Create a huge, fast RAM disk from the large memory of the **MultiRam™ CX**. RAM Disk software for ProDOS and DOS 3.3 is included with the card as



well as programs to customize RAM and copy files to and from the immense, lightning fast RAM disk (20 or

more times faster than floppies). Pascal RAM disk software is also available.

Run an ever-growing number of programs with MultiRam's™ expanded memory. Supercalc3a, Locksmith, Catalyst, MouseDesk, Sensible Speller, Pinpoint, Jeeves, CopyII+, MegaWorks, Word Perfect, Sensible Grammar, BusinessWorks, MouseWrite, MouseCalc, MacroWorks and many more programs now use or will soon use the added memory of the **MultiRam™ CX**.

Also, you can easily add the 65C816 option to your **MultiRam™ CX** to run new, powerful 16-bit software like VIP Professional, a Lotus 1-2-3 workalike.

Best of all, the **MultiRam™ CX** card **\$199⁹⁵** is as inexpensive to buy as it is easy to install and use: \$199.95 for 256K and \$259.95 for 512K.

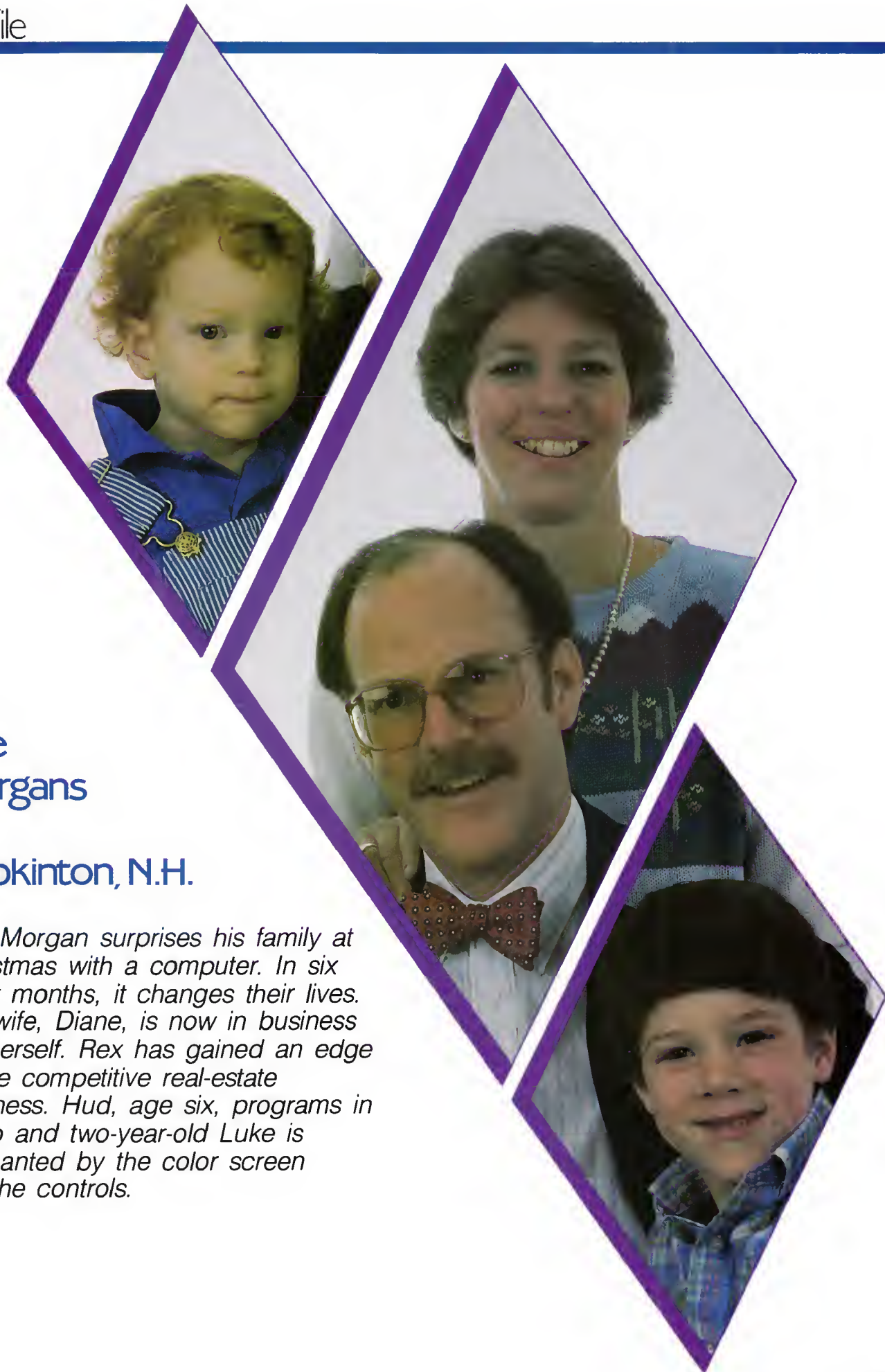
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The Morgans of Hopkinton, N.H.

Rex Morgan surprises his family at Christmas with a computer. In six short months, it changes their lives. His wife, Diane, is now in business for herself. Rex has gained an edge in the competitive real-estate business. Hud, age six, programs in Logo and two-year-old Luke is enchanted by the color screen that he controls.

BEGINNERS' LUCK!

by Pat Haley

Rex and Diane Morgan are raising their children in the kind of town artists look for when they want to show a quaint New Hampshire community. White houses, white churches, space, greenness, tidiness, neighborly talk down at the store—it's all there in Hopkinton. There's never been a need to pave the road that leads to the Morgan house just outside the village, but somehow it's important that Diane stencil the walls of her dining room, to keep pace with Hopkinton's slower movement through time.

And these days, in the corner of the same room, a new Apple //c is propelling the Morgans into their future. It arrived only last Christmas, but it's already helping this family establish a home-based business. They're using it for direct mail, list management, real-estate sales, bookkeeping, even the production of 12-foot-long greeting cards. Around the house, it helps with meal planning and serves as a teaching aid. For 6-year-old Hudson Morgan and 2½-year-old Luke, it's homework, play, and a school-away-from-school. The whole family is exploring applications, software, and accessories as if it were still Christmas. The only limits they've noticed so far are a young family's budget and a venturesome family's imagination.

Planning for the Future

When Rex Morgan bought a computer, he was in a future-building frame of mind: "I know the computer will be part of our children's lives just about as much as the tele-

phone has been part of ours. Hud and Luke will use computers in school, in college, in their work. Hud was started on an Apple //c in kindergarten."

Rex was also thinking about his own future. His chimney-sweep business is thriving, because in this part of New England people who heat with wood need a reliable chimney sweep as much as a dentist. But Rex recognizes that climbing on rooftops may not be as much fun when he's 50. He's building a career in real estate, too.

"By the time I shopped for the computer, I knew I was going into real estate, a fast-paced business," Rex explains. "I suspected a computer could help me get a competitive edge in many ways."

Rex bought the Apple //c as a surprise, a special splash for Diane and Hud for Christmas 1985. "I did a lot of shopping. I went to two Apple dealers in Concord, another in Manchester," Rex recalls. He visited the computer department at a local discount store, too. "Then I bought the Apple computer where the dealer put together the best package."

Ordinarily outgoing and articulate, Rex was smitten with the widely known First Computer Jitters as the couple assembled their //c: "Like most people, I was awestruck." But Diane took the lead because she had worked with computers and was unafraid to use the tutorial disks. "You soon learn that you can't hurt a computer unless you do something like pour coffee on it," she says.



"I was going into real estate. I suspected a computer could help me get a competitive edge in many ways."

Rex persisted and was rewarded with a growing awareness of the applications—direct-mail marketing, for instance. He had used direct mail when he was circulation manager for *The New Hampshire Times* and later at *Wood 'n' Energy*, a national trade magazine for the wood-stove industry. At *Wood 'n' Energy*, he maintained the magazine's circulation audit and did test marketing through direct mail. He also promoted his chimney-sweep business through the mail.

A computer, Rex says, can fine-tune any mailing list to make it more effective: "You can create very specific lists by identifying an affluent neighborhood and using the professions of the residents as part of the key. Then, for example, the local Saab dealer could target the right customers and not waste money mailing to people who are unlikely to buy that car."

The possibilities for list management with the Apple //c are exciting for Rex. "At the real-estate office, we stay in touch with a lot of people and do mailings on a regular basis," he notes. "I can now send out my share of the Coldwell Banker newsletter with the mail-merge program of our **Bank Street Mailer**."

Rex believes using personalized letters in a direct-mail campaign increases the chances of recipients reading the material. "People get barraged with so much mail today that a letter has to be personalized or it'll be thrown away," he observes.

Rex is planning a mailing to convert his chimney-sweep customers into real-estate prospects: "I took a lot of care with my customers, teaching them how their wood stoves work. Now I'll write them personalized letters telling them what I'm doing, how I can help them buy or sell their homes."

The Morgans may have already outgrown Bank Street Mailer, which files up to 255 names and addresses. As they consider offering list-management service, they're thinking about **List Handler**, which can sort 3000 names.

For word processing, Rex enjoys working with **Mouse-Write**: "I like playing with the pull-down menus. On the other hand, Diane is a touch-typist and finds working with the mouse distracting."

Other software packages Rex finds useful include **The Print Shop** and **The Newsroom**: "The Print Shop has an

incredible array of graphics." And Rex has actually used The Print Shop to keep warm: He made an instant, friendly sign to remind people to close an office door and keep out the draft. Rex adds, "We also have The Newsroom, which can teach children how to publish their own newspaper. I think it might be fun to publish a Morgan family newsletter to keep in touch with people."

When the Morgans purchase more software, they'll probably shop by mail. Rex remarks, "I was really surprised by the great disparity in prices between retail and mail order. According to the ads I see in *inCider*, the prices are all over the road. You see software that sells for \$120 in a retail store available for \$58 by mail. You call a toll-free number and it's delivered to your door. I can't imagine paying retail prices for software anymore. I guess this is something dealers are going to have to come to grips with."

Rex has also learned to shop around for disks. "There are wild fluctuations in price. And another way to save money is buying paper at a business-form dealer rather than a computer store. You can get 2500 sheets (fanfold, 8½-by-11 inches) for \$17."

Like most computer owners who regularly print text, data, and graphics, Rex is annoyed that ribbons fade so quickly. The **ImageWriter II** uses a ribbon that retails for about \$7. Rex knows about home re-inking kits and services, but he thinks they're too much bother. "We've been looking for new ribbons that will last longer. Dealers know about this problem, but many of the ribbons are made by the same manufacturer. I know one dealer who's searching for a new ribbon manufacturer," he says.

Rex is an organized person who thinks a computer can help hopelessly disorganized people cope with filing large amounts of information: "I was in an office the other day and watched someone hunt for a name and address in an incredible mess of scraps of paper and matchbook covers. I don't see why that person couldn't buy a list manager to sort it all out."

But there's more than rescuing the muddled in Rex's computer future. Both he and Diane crackle with additional ideas they're eager to try. "Imagine developing and marketing all kinds of businesses right out of your own home," Rex says. "All you need, really, is a plug in the wall. And maybe UPS."

Building a Home Business

Diane Morgan is no stranger to computers. When she worked for the New Hampshire legislature, she used an IBM OS6. She spreads her arms as she describes the machine: "It was huge, but we thought it was amazing because it could deal with the names of all the legislators."

Today, Diane's Apple //c can perform that task and much more. But seven years ago, sorting out all 400 members of the largest state legislature in the nation was an astonishing feat.

Since then, Diane has moved on to *Wood 'n' Energy*. She's in charge of the editorial department's special projects, including *The Buyer's Guide*, an annual directory. She used the company's Radio Shack computer, recently replaced by an IBM PC-AT.

Although the Apple //c was a surprise, she's pleased with her husband's choice. The Morgans had discussed buying a computer and had consulted friends who used Apples, but hadn't set a purchase date.

"We felt Apple was a good company, and that if anything went wrong, we were sure they would correct it," Diane says. The Morgans set up the computer without a glitch. "The Apple products and the software had no flaws, so we didn't need any dealer support. Besides, the manuals are clear," she adds.

Within weeks Diane and Rex discovered **The Print Shop**, and they were literally in business. At first, they printed 12-foot-long greeting cards for the fun of it. Then they saw the commercial possibilities and decided to sell the banners, calling their business "Great Big Greeting Cards."

"For \$9.95 we'll mail one of these banners anywhere in the United States or Canada," Diane says. The **Image-Writer II** printer is fitted with a bright blue ribbon, and the illustrated message is personalized in 8-inch letters on brilliant-yellow 60-pound paper.

"Flowers wilt and balloons lose their air, so we're offering a more permanent message," Diane explains. "We know we're not the only ones in the country doing this, but we're also offering a special service. We'll take over people's greeting-card lists for an entire year and send a Great Big Greeting Card on every special occasion."

To get the word out, the Morgans send the cards to friends for birthdays and anniversaries. An order form is included. Using **The Print Shop**, Diane and Rex also print their own letterheads.

Diane is considering buying Apple's **AppleWorks** package, because it offers word processing, a data base, and a spreadsheet that can be used for business and family money management. "It seems as if half of our needs could be answered by AppleWorks. We have some other business ideas, too, and an integrated package would be just right," she says.

She's checked mail-order prices for AppleWorks, but notes that the ads often carry the instruction "Call for prices." "Like lobster on a restaurant menu," she laughs.

For shopping the market, Diane recommends the **Apple //c Handbook** from Ballantine: "It's very useful for finding out what's available."

Diane never expected to be shopping for computer software this spring. In fact, there was only one item on her 1985 Christmas wish list: "All I asked for was a decent set of measuring spoons."

In one way, her wish was granted. A software-package gift from Rex included **Micro Cookbook**. "It's very useful," she says. "The other night I had some cooked chicken left over. I checked Micro Cookbook and came up with four different recipes."

Micro Cookbook includes a shopping list, and can even

adapt the serving size of any of its recipes. If at the last minute Diane invites two people to stay for dinner, she can accurately adjust her chicken recipe to serve six instead of four. She and Rex have also begun adding their own favorite recipes to Micro Cookbook. It beats a set of measuring spoons.

Diane sees further business possibilities, including list management for local businesses: "There's a woman who owns a small fabric shop in town, for instance. She could use a computer-based mailing service to keep in touch with her customers." Diane sews and knits and looks forward to the day a computer program will simplify pattern design and adjustment.

Working at home at your own business—everybody's fantasy—may become an enduring reality for Diane. And she's found other applications at home, as well. Her //c has even turned out to be a useful parental teaching aid.

For instance, there's nothing like trying to get children to write thank-you notes, right? Not if you're 6-year-old Hudson Morgan growing up with a //c.

According to Diane, "It began when my sister's kids—they're 12, 10, and 8—sent computer-generated thank-yous within a week of receiving their Christmas gifts from us. Hud was excited and wanted to write his notes on the computer, too, so he typed in 'Thank you for the truck,' and marveled when it printed out the same way."

Miss Manners, no doubt, would approve.

Turtles and Lemonade

When 6-year-old Hudson Morgan entered kindergarten last fall, he soon became familiar with the Apple //c.

At the Harold Martin School in Hopkinton Center, the children go two-by-two to the computer. "The programs they have at school require two users, and it's good socially for the children to work together and not be isolated with a computer," says Diane, who volunteers two mornings a month in her son's class.

The kindergartners use **Logo**, an educational computer language that has a turtle for a cursor. The children write their own programs and record them in program books.

Hud also uses Logo programs at home. He claps his hands when the computer praises his latest move by flashing "Turtle-riffic!" on the screen.

"It's fun for him," noted Diane as she watched him play **Space Quarks** from the **Apple at Play** program. Hud moved his index finger rapidly between two keys as pink and green creatures surfaced on the screen like bubbles in champagne.

*"It seems as if
half our needs could
be answered by AppleWorks."*



"I'm trying to get Hud to use two fingers simultaneously rather than moving back and forth between keys," Diane commented. She's considering buying a program to teach the children touch typing.

Hud moved on to **Lemonade Stand**, a game that teaches you that even kiddy lemonade sales can go sour—as when Mom cuts off the free sugar or the rains come. The day Hudson Morgan played Lemonade Stand,

"He knew he'd won when the computer played We're in the Money."



he knew he'd won when the computer played *We're in the Money*.

"One of the nice things about the Apple //c is the volume control," says Diane. "There are times I don't want to hear Hud's games."

Hud shifted to **MousePaint**. He began drawing, then rotated his design 180 degrees. He reached for the manual to check an editing function (he's bright and can already read). When I asked what he was doing, he answered, "I want to change something." He clicked the mouse and continued to draw. Diane says he's already worked out several shortcuts in other programs.

"Children aren't intimidated by computers," Rex observes. "They don't stand there and think, 'Well, I don't understand how this thing works, so I can't do it.' They just do it."

But children can quickly lose interest when faced with a monochrome monitor. "We got a color monitor for the children. You have to have color to keep kids tuned in," Rex says. "They're used to color TV."

Diane finds the color monitor distracting when she types, though, so she switches off the color.

Hud finished his sketch, and Diane turned on the

ImageWriter II. The drawing rolled off the printer—all in bright blue. Why just one color? "To print in several colors you need a program like Dazzle Draw and a multicolor ribbon in the printer," she explains.

Next it was Luke's turn. At the age of 2½, he uses **Elf Paint**, a computer "coloring book." With coaching from Diane, he keyed colors and textures from a field of swatches, then applied them to a plump hen—she glowed in pink, green, and sky blue.

"He knows his alphabet—he learned it from *Sesame Street*," Diane notes. "But it takes forever for him to locate each letter."

Elf Paint has its limitations, Diane says. "But it was only \$17.50. And you have to choose any children's software carefully because they can quickly outgrow some programs."

Just like skates and skis. ■

Pat Haley is a writer living in New Hampshire. Her Nine Seasons Cookbook was published this year by Yankee Books, and she's currently using her Apple //e to work on her second cookbook. Write to her at Atherton Hill Road, Spofford, NH 03462.





Product Information

Apple at Play

Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
Included with //c

Reader Service Number 300

Apple Logo, \$100
AppleWorks, \$250
ImageWriter II, \$595
MousePaint (with Apple Mouse), \$149 (//e), \$99 (//c)
Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010

Reader Service Number 301

Apple //c Handbook
Ballantine Books
201 East 50th Street
New York, NY 10022
(212) 751-2600
\$14.95

Reader Service Number 302

Bank Street Mailer, \$69.95
Dazzle Draw, \$59.95
The Print Shop, \$49.95
Broderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170

Reader Service Number 303

Elf Paint
Elfware
P.O. Box 118
Pollock Pines, CA 95726
\$17.50

Reader Service Number 304

List Handler

Advanced Logic Systems
1195 East Argues Avenue
Sunnyvale, CA 94086
(408) 730-0307
\$79.95

Reader Service Number 305

LogoWriter

Logo Computer Systems
9960 Côte de Liesse Road
Lachine, Quebec
Canada H8T 1A1
\$299

Reader Service Number 306

Micro Cookbook

Pinpoint Publishing
2823 Steinmetz Way
Oakland, CA 94602
(415) 654-3050
\$49.95

Reader Service Number 307

MouseWrite

Roger Wagner Publishing
10761 Woodside Avenue
Suite E
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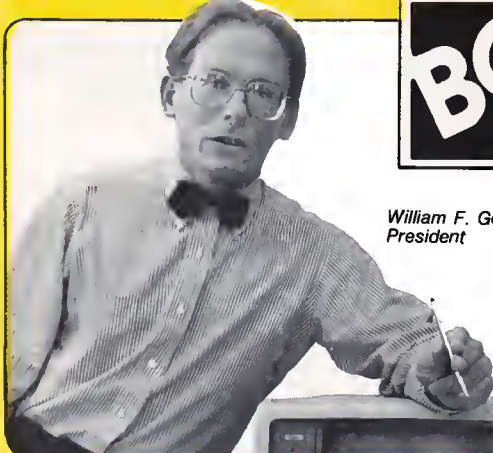
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BBS and BUSINESS: A Profitable Pair

*inCider looks at a profitable new trend in marketing:
doing business by bulletin board.*

by Wendy Lea McKibbin, *inCider* staff

Electronic bulletin boards are all the rage in Houma, Louisiana. At least four local establishments, ranging from Ray's Bayou Doughnuts to the local ComputerLand franchise, maintain computerized information forums for their customers or other interested callers. And the parish school board is considering a bulletin board so that housebound children can communicate with their teachers.

"Ray [of doughnut fame] probably started it," says sales representative Mike Blanchard of ComputerLand, in tracing the development of BBS's in town.

The Bayou Board, which advertises the doughnut shop while providing a community service, operates 24 hours a day, 365 days a year, "except for Mardi Gras and hurricanes." Since 1984, owners of Apple, Tandy, and assorted MS-DOS computers have been dialing up Ray Barnes' board to receive system support information and try their hand at winning a few free French crullers.

Somewhat less accessible are the part-time bulletin boards of ComputerLand and its competitor, The Computer People. Even with shorter BBS operating hours, both retailers are strong advocates of on-line communications as a way of reaching out to current and prospective customers.

"It's really a way of making friends in the community," explains Blanchard, whose bulletin board receives 25 callers a night. "If you've been helpful to people and answered their questions, then sooner or later they're going to come to you when they're ready to buy new equipment and supplies."

Customer outreach via computer is an idea that independent professionals and a number of small establishments around the country are repeating with varied success. A stockbroker in Denver, Colorado, maintains a daily listing of stock quotes for his clients on a dedicated Apple II Plus computer. A couple in Santa Fe, New Mexico, who have retired from the CIA advertise their tax-consulting business on a bulletin board they created to provide information on ski conditions for tourists. They also let local businesses place ads on the BBS for \$35 per month. A full-service insurance agency in Washington, New Jersey, sells personal-computer policies on line to state residents. And a computer bookstore in Sunnyvale, California, sells books on line and holds open discussions for bulletin-board customers.

Not all "BBS for business" stories have a happy ending, though. A critical factor would appear to be the computer literacy of the clientele. For example, the rock station KGON of Portland, Oregon, organized a bulletin board several years ago when the personal-computer market was at the height of its growth, but abandoned the project a year later.

According to KGON program director Peter Bolger, the board never received enough callers to justify the cost and effort of operation. The station's full-time systems operator (sysop) had little to do except remove messages



from the board. In retrospect, Bolger says it boiled down to a problem of market saturation: There were simply not enough listeners with personal computers.

The plight of KGON illustrates what Ted Landberg of the National Bureau of Standards in Gaithersburg, Maryland, identifies as the principal factor you should consider when starting a bulletin board—namely, the match between client population and personal-computer owners.

"A company can sell almost any type of product or service and still be a good candidate for a bulletin board, *if* a critical mass of its customers or clients own a personal computer with dial-up capabilities," Landberg says.

Is a BBS Right for Your Business?

Bulletin boards are particularly effective for companies that regularly handle several hundred products or whose printed price lists speedily go out of date. Firms with large populations of bargain-hunting customers might also be good prospects for a BBS, Landberg suggests. (He points out that the federal government is a perfect candidate for a bulletin board, since the data in many government catalogues become obsolete very quickly.)

Bulletin boards can act as public-information officers for a company by dispensing product announcements and news releases or answering frequently asked questions. They can act as service representatives providing round-the-clock software support or as departmental message

centers for traveling staff members. A BBS can become an on-line sales tool, giving customers an easier way to select and pay for items, while reducing staff requirements for invoicing and purchasing.

"For the modest investment of 3000 low-risk, high-pay-back advertising dollars, a small business can create the image of being a state-of-the-art establishment," Landberg declares.

"The bulletin board is really the precursor of electronic product delivery," he continues. "It allows the businessperson the opportunity to gain valuable experience in electronic marketing for very few dollars."

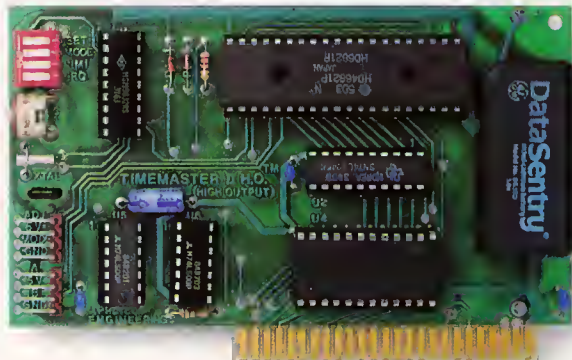
Profit on the Side

A bulletin board is also an ideal sideline business, given the right circumstances. It can operate unattended, you can maintain and update it on nights and weekends, and it costs very little to set up.

Landberg recommends that the prospective BBS operator give careful thought to a topic area. A bulletin board needs a theme or a well-focused, well-defined purpose. And anyone considering this step should first make certain that a sufficient audience exists to justify the purpose of the board.

Next, the operator should have excellent resources or expertise in the subject matter. Barring personal reservoirs

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"A bulletin board needs a theme or a well-focused, well-defined purpose."

Ted Landberg

of talent, you should have a group of collaborators to help provide information. "Otherwise, the well will run dry very quickly, and you'll have a stale product," Landberg cautions.

The revenue base for a bulletin-board business may be modest at first if it depends on on-line advertisements to generate income. Given time and the right mix of products and clients, though, it can operate quite profitably.

For example, Yellow Data Company of Boston, Massachusetts, is a videotext operation that essentially runs a sophisticated bulletin board. Retailers, theatres, transportation companies, and investment firms list their wares on line for \$300 per month.

Yellow Data averages about 600 ads per year. Although it's a much more costly and complicated enterprise than a single, dedicated microcomputer, Yellow Data's success illustrates that firms will pay to advertise on an electronic medium if they're convinced they're reaching an important audience.

Another approach to revenue generation for the BBS moonlighter is to use the bulletin board as an on-line mail-order house for your own or others' products. Or you could direct callers to needed goods and services in the area and negotiate a commission with the vendor for each placement. Better yet, for a modest fee you could offer to create and maintain a bulletin board for a small local business that lacks the time and resources to produce its own.

Whether it's an individual or a small business taking a first crack at a BBS, Landberg says it will be three to six months before traffic picks up on the board. Things will move a little more quickly if the operator engages in an aggressive advertising campaign.

Spreading the Word

How can an establishment or a sole professional spread the word that a bulletin board is open for business? One of the easiest ways is to advertise on other bulletin boards in the area or nationwide.

An individual in Boulder, Colorado, maintains a BBS called the Professional Board, which provides a yellow-pages directory of professional bulletin boards. Interested parties can reach the sysop, Bob Voorhees, by voice at (303) 673-7133 or by modem at (303) 740-2223.

Other possibilities for promotion are to get a free listing in *The Computer Shopper* by mailing a notice to "Bulletin

Product Information

Bulletin-Board Software

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CommuniTree Software creates a hierarchical data base of files and subfiles that makes it especially applicable for computer conferencing and dissemination of information. It can handle 20 different topics and lets callers do full-text or string searches. It also includes a browse function, which lets users scan topics for the whole tree or just one branch. CommuniTree requires an Apple II, II Plus, or IIe with at least 48K of RAM and one drive, although it can support up to six drives.

Reader Service Number 323

GBBS II and GBBS-Pro
Micro Data Products
5739 South Olanthe Court
Aurora, CO 89915
(303) 699-1161
\$95 (II), \$125 (Pro)

GBBS II and GBBS-Pro, an enhanced version, are comprehensive BBS packages that provide messaging, multiple boards, and private-mail capabilities. GBBS II is user-modifiable. It has 120 security levels and a text editor, and gives the sysop remote-access capabilities. GBBS II supports the Apple II, II Plus, or IIe with 48K or 64K, and the Apple III in emulation mode. GBBS-Pro is the ProDOS version of the product, enhanced to run at machine-language speed. It provides a "global quick scan" to show new messages on each board, mail forwarding, batch mailing, and a profanity filter. A data-compaction feature lets the

sysop save up to 40 percent more space on each disk. GBBS-Pro requires two floppy-disk drives and a minimum of 64K. It doesn't run under Apple III emulation.

Reader Service Number 324

Let's Talk

Russ Systems
320 Dufour Street
Santa Cruz, CA 95060
(408) 458-5080
\$175

Let's Talk requires an Apple IIc or IIe with 128K of memory and an auto-answer modem. The program provides public and private data boards, electronic mail, conferencing, uploading and downloading of files in text and binary format, and information directories according to topic.

Reader Service Number 325

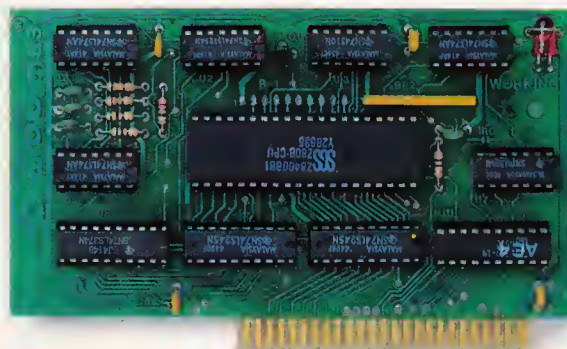
Networks II

High Technology Software Products
P.O. Box 60406
Oklahoma City, OK 73146
(405) 848-0480
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Networks II provides standard features such as private and public mail, mail waiting, text editor, and automatic password assignment to new callers. It's been around since 1981, and some users consider it the best proven and most reliable bulletin-board software. A BBS running on Networks II can receive program or text files and can handle eight different topic areas. It requires a minimum of 48K of memory, one drive, and a Hayes Micromodem II, IIe, or compatibles. Networks II works with an Apple II, II Plus, or IIe.

Reader Service Number 326

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Board," *The Computer Shopper*, P.O. Box F, Titusville, FL 32781. A second publication that carries BBS listings is *Bulletin Board Systems* magazine, from Meckler Publishing (111 Ferry Lane West, Westport, CT 06880). The computer trade journals are also an effective, if costly, alternative.

Ted Landberg suggests getting the word out to local computer clubs, or putting ads in newspapers or the telephone yellow pages. And if it's a small business establishing the BBS, the proprietor can always spread the word at a Chamber of Commerce meeting.

Finally, a modem manufacturer may be willing to pack fliers in its product boxes. Or perhaps local computer retailers can post BBS listings in their stores.

Ingenuity can supplement even the most modest advertising budget. But, fortunately, there are a number of inexpensive ways to get the message out to the world of electronic communicators.

Getting Started

The minimum materials required for establishing a bulletin board are a computer system you can dedicate to the BBS, a dedicated phone line, a modem, and bulletin-board software (see the accompanying Product Information sidebar). Two optional features that come highly recommended are a clock card, so that the sysop doesn't have to manually change the date on the board every day, and a printer, also for the convenience of the sysop.

Aside from the physical requirements, the operator must be willing to make a substantial time commitment toward maintaining a bulletin board.

"Try to imagine how much time it's going to take, and then double it," says Bill Christison, who runs a ski-information BBS in Santa Fe, New Mexico, with his wife, Kathy.

Some sysops say they spend as much as three hours a day reading messages, adding and deleting information, and cleaning up the files. You must also consider normal computer maintenance and standard security issues.

Almost every BBS operator around admits to having trouble with prank callers and vulgar messages. The sysop must be prepared to police the message board for unacceptable material. Some boards have software programs that will automatically reject obscene words, but this isn't a universal feature.

Avoid the Bandwagon

A bulletin board isn't a marketing tool every business can use. As mentioned earlier, the most important guideline when considering a BBS to enhance your business is the match between computer owners and your clientele. Of course, there's always the option of creating an information center of data unrelated to your business, then using the bulletin board as an advertising vehicle for your products or services, à la Ray's Bayou Board in Houma, Louisiana. Just be sure you have a clear idea of your audience, or you may end up wasting money, as happened in the case of KGON radio in Portland.

Perhaps the most intriguing aspect of setting up a BBS is that it provides experience in an important new area of marketing. If, as Ted Landberg predicts, the bulletin board is a precursor of business practices to come, then your own BBS might be the perfect opportunity to prime your business for the future. ■



"Machine barriers are beginning to break down."

A Good Investment

Jim Pritula is a full-time stockbroker and vice-president of Eagle Securities in Denver, Colorado. Yet he finds time on the side to maintain a 24-hour-a-day bulletin board called the Stock Market BBS, which operates as a public service for 400 steady users.

About ten callers a day dial up for information about their favorite stocks or to trade on line. The BBS includes general text files about the stock market that cover such topics as "over-the-counter stocks" and "new legislation." An on-line library tracks important books about the market, and there's even an electronic dictionary for ready reference. (For example, did you know that *arbitrage* means "a simultaneous transaction"?)

Pritula explains that you can create a file on any stock you want to watch. Brokers type in the closing quotes for the day, and they're captured in the file. The information may not be as comprehensive as that the Dow Jones News/Retrieval Service would provide, but, on the other hand, it's free.

New callers can sign up on the board for passwords, and even open a brokerage account through the bulletin board.

The board operates at 300 to 2400 baud and is based on an Apple II Plus computer, although Pritula occasionally uses a Franklin instead. The system uses GBBS-Pro, bulletin-board software developed by Micro Data Products, another Denver-based company.

Pritula says bulletin boards are a promising medium for communications and are sure to attract more callers in the future. They're popular because they let people with Apples and IBM's talk to each other, he points out. The BBS phenomenon signals that "machine barriers are beginning to break down."

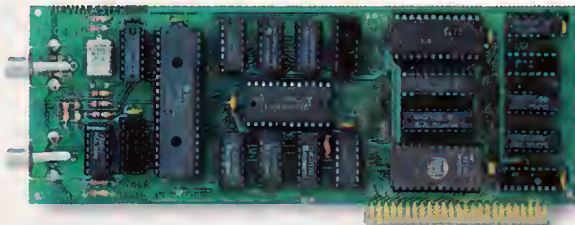
Has the Stock Market BBS brought to this Rocky Mountain stockbroker customer traffic he might otherwise not have had?

"Without a doubt," Pritula declares. "Unquestionably, it's been a good investment."

Interested callers can dial up the Stock Market BBS at (303) 369-8397. □

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BBS and EDUCATION:

Reaching Beyond The Classroom

A BBS can be a valuable resource at any level of education. Here's a look at two schools that have made their systems work.

by Lafe Low, *inCider* staff

As computers become a more integral part of the U.S. educational system, teachers and administrators are finding more ways to use them. Besides programming, word processing, and computer-aided instruction, bulletin-board systems (modem and software hookups to telephone lines) and on-line services are becoming an important part of the computer's role in education.

Let's look at the way two schools at different levels have used telecommunications and BBS's with equally successful results. A senior high school in Pennsylvania has made its BBS available to the students and adults in the community, and thus expanded the school's sphere of influence. An education department at a college in New Hampshire subscribes to a nationwide BBS for special-education administrators, which helps organize resources throughout the state and the nation. Both schools have benefited.

Tom Pryts (pronounced *pritz*), microcomputer director at Reynolds High School in Greenville, Pennsylvania, has set up a BBS that students, parents, and teachers in his school district are all using and to which they're contributing quite actively.

"A state grant allowed us to create a fairly sizable computer lab," Pryts says, to serve a large rural district consisting of four elementary schools, a junior high, and Reynolds High School. The Reynolds BBS uses Apple

IIe's and GBBS communications software (the DOS version of the system *inCider's* bulletin board uses), developed by Greg Schaefer. With its new BBS, Reynolds High School can communicate with school districts in other areas of the state.

Plymouth State College (PSC) in Plymouth, New Hampshire, also has a BBS, but it's part of a highly specialized system. Dr. Stephen Weissmann, associate professor of education at PSC, logs on to SpecialNet, a BBS/E-mail system that provides his department with a tie-in to sped (special education) administrators nationwide.

A special-education grant from the state of New Hampshire allowed PSC to hook in to SpecialNet. Now Weissmann travels around the state to train other sped administrators in use of the system.

A BBS for All Reasons

The Reynolds High School BBS "just got started," Pryts says enthusiastically. "We went on line October 4, 1985, and we've already noticed benefits in having this system." An "exchange of ideas and information" has been the focus, he adds.

This BBS is for both parents and kids. "Johnny and Mom and Dad can log on and see what's on next week—from lunch menus to basketball schedules to when that bio exam is coming up," according to Pryts. So far, the number of adults using the system has been roughly equal to the number of students logging on.



Not all information on the board has to do with computers, Pryts explains. There's "everything from pen-pal lists for fifth-graders to stories for senior-high students" on the BBS at any given time. "It's already developing a personality," Pryts says like a proud parent.

Some BBS's are for exchange of special-interest or technical information. The Reynolds BBS provides mail exchange for all users, plus articles written for the BBS newsletter, *The Computer Forum*.

The newsletter is formatted at the high school and produced on a Macintosh using ReadySetGo, MacDraw, and MacWrite programs, according to Pryts. It involves both students and adults who use the system. They upload students' articles from their homes, and send out surveys to other Mercer County schools for updated information about what's happening in those locales.

"The newsletter is an outgrowth of what the BBS is about," Pryts explains. "It's a way of communicating. The BBS and the newsletter go hand in hand."

At the student level, a BBS can be an effective, enjoyable way to learn from each other through increased communication and interaction. Students from neighboring districts have even put files on the Reynolds BBS. It's created something of a competition: Two nearby school districts have "suddenly found the funds to open their own BBS's," Pryts reports.

Many schools also use BBS's and E-mail at the administrative level, to keep the channels of information open and easily accessible to those who coordinate educational activities and policies.

For instance, the New Hampshire SpecialNet Plymouth State College uses includes E-mail and two statewide BBS's, as well as access to 36 SpecialNet BBS's across the country. The nationwide BBS's cover specific topics ranging from employment opportunities and software to special early-childhood education and federal legislative news. The nationwide system runs on GTE Telenet's main-frame computer, based in Virginia.

Hundreds of schools are involved in the SpecialNet system, according to Stephen Weissmann. The network is designed mainly for administrators, rather than teachers, although teachers benefit indirectly, he explains. But SpecialNet is for "those setting policy and paying the bills."

The SpecialNet system "allows isolated sped administrators access to national information," Weissmann says. "Say you're sitting in Colebrook, New Hampshire. You can dial up a BBS and access all this information without leaving your office."

Reach Out and Log On

The Reynolds BBS is on line after school hours, from 4 to 7 p.m. If school isn't in session, it's up 24 hours a day.



"The Reynolds BBS uses Apple II's and GBBS communications software, developed by Greg Schaefer. With its new BBS, Reynolds High can communicate with other schools."

"I think we've logged on every type of computer ever made," Pryts says. "Someone actually called using a Timex 2000."

Some businesspeople who travel in the area have even been using it to leave messages for their clients and fello employees back at the office. Pryts has received calls from some of them thanking him for starting the BBS and asking if there were any charge for the service.

The Pennsylvania Association of Business Officials has asked Reynolds High to put on a demonstration of what a small BBS can do, as an initial training step for business professionals interested in starting BBS's. Pryts is looking forward to the presentation. He says, "Our system is friendly enough to take the fear out of going on line."

The more he talked to students before installing Reynolds' BBS, the more students Pryts found buying personal computers and modems. The students can now bring the school into their homes through the Reynolds BBS. "Eventually we'd love to use the BBS for taking courses at home for kids and adults," Pryts says. And according to Pryts, a number of people in the community were waiting for a service they could call without incurring high long-distance rates, as there's no local CompuServe number in that area of Pennsylvania. "It's really filling a need," he says.

When asked if there were any problem with the current system, Pryts chuckled, "Not enough phone lines." Students and adults alike sometimes try all night long to log on to the Reynolds High School BBS. In response, Pryts has introduced a 15-minute time limit for users, though he says he's considerate and waits until a user is out of a file before ending a call.

Stephen Weissmann reported a different sort of difficulty with his system. As most sped administrators using SpecialNet are first-time users of BBS's—or computers in general—the lack of technical skill among users is a problem, Weissmann explains. Some find the procedure confusing, he says, but overall, the network is an excellent

means of improving access to information.

Pryts has three points of advice for any school system interested in starting its own BBS. "My first suggestion would be to go slowly and do your homework," he says. "Find out the number of people who have modems and no place to call." He also recommends that schools keep their BBS's strictly organized and regulated. He allows no aliases on the Reynolds BBS, and he scans it often for such illicit users.

A BBS should have a full-time sysop (systems operator) to take care of it so that it meets its defined goal, Pryts says. It shouldn't become a "pirate's nest," he warns, adding that an amateur board may dissolve because of a loose setup and lack of control. "You shouldn't have a problem," Pryts concludes, "if you stick to these three things."

The greatest benefit of starting the BBS has been involvement with people who may not even have kids in school, according to Pryts. It has "extended the reach of the school," he says. In fact, Reynolds has dubbed its new telecommunications network the Outreach Program. This type of interaction tends to have a positive effect on the community, Pryts observes. "People are more supportive of the school even if they don't have kids."

The Reynolds High School BBS and Plymouth State College's connection to SpecialNet thrive on interaction. Using the communications capabilities of their computers, these two institutions have increased the flow of information between the school and the larger world for the benefit of students, parents, teachers, and administrators—and it hasn't been prohibitively expensive.

Weissmann encourages subscribing to a system like SpecialNet: "The costs are so low that even a reasonably sized school can afford it." And as more schools add a line for telecommunications to their computer-education budgets, the number of BBS's will grow, bringing with them expanded access to new and varied information. ■



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Why learn BASIC? inCider's Applesoft Adviser shows you how you can take advantage of your computer's power.

LEARNER'S PERMIT

by Dan Bishop

"Why should I take the trouble to learn BASIC? With all the super programs available nowadays, I'll leave the programming to the experts."

—frequently overheard remark

When the personal computer first came on the scene some ten years ago, learning to program in BASIC was a necessity for the new computer owner. But as more and more application software began to appear, computer retailers took up the "user-friendly" slogan, downplaying the need for any knowledge of programming. The popular argument ran, "You don't have to be a mechanic to drive a car!"

Though it's true that you can make good use of your computer and still know nothing about programming, I've made some interesting observations in the years I've worked as a microcomputer-systems consultant and custom programmer. I've installed systems and developed programs for businesses in which employees knew nothing about BASIC. I've also had clients whose knowledge of BASIC, though slight, was sufficient to make minor program alterations and enhancements to suit changing needs.

The difference between these two types of situations is tangible. Tension and anxiety in the workplace are noticeably lower when someone can fix simple problems and recognize the more serious ones that need an expert. Opera-

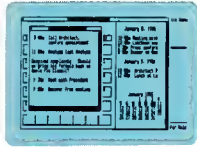
tions are more efficient, since the delay in waiting for the expert to arrive is eliminated for the simple tasks. And the person who has learned something of programming can often provide the expert with enough information about a problem so that he or she can make an accurate diagnosis over the phone, and solve it without the inconvenience and expense of a "house call."

Based on these firsthand experiences, I suggest that the analogy for learning to program in BASIC is closer to learning to drive a car. The expert programmer who writes detailed programs for sale is the mechanic who works on the engine. Mass transit (the application program you purchase) is always available for long distances (such as payroll or word processing), and should be as "user-friendly" as possible. But for the simple trips, such as changing the tab positions in a PRINT command to fit a new invoice form, or altering a DATA statement to reflect a change in the state sales-tax formula, you should be able to get from point A to point B on your own. You can do it if you have a fundamental understanding of BASIC programming.

'Rithmetic

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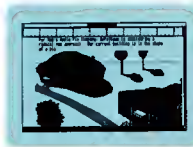


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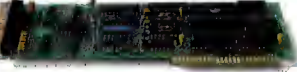
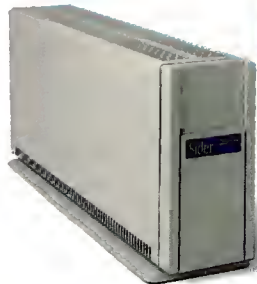
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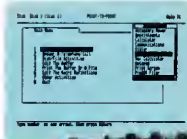
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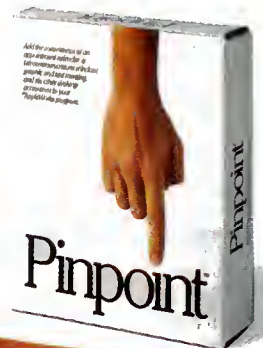
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The next level in open-architecture, Pinpoint can grow beyond the original set of eight Desktop Accessories to include up to 16 Accessories on the Pinpoint Desktop. For example, when they actually become available, you may want to add new programs like:

- ▲ Pop-up Spelling Checker
- ▲ Pop-up Thesaurus
- ▲ Pop-up Grammar Checker
- ▲ Instant Macro Keys
- ▲ Personal Check Writing
- ▲ Things to do Quick Lists
- ▲ Telephone Call Accounting
- ▲ Home Security and Appliance Control
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In fact, some of these programs are just now becoming available from Pinpoint and other software developers.

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PINPOINT'S POP-UP FEATURES

- ▲ RAM resident with extended RAM support or disk-based Accessories.
- ▲ Pop-up from inside AppleWorks, Business Works, and other selected ProDOS software.
- ▲ Work with Catalyst, Mouse Desk and Prosel desktop managers.
- ▲ Always available. Closed-Apple-P pops-up PINPOINT's main menu can display up to 16 Accessory titles (8 supplied with the original Pinpoint program).
- ▲ AppleWorks' 55K desktop remains undisturbed with PINPOINT installed in RAM (basic 128K Apple II configuration).
- ▲ Open-Architecture. Uses ProDOS system files for Accessories—up to 16MB RAM each using segmented memory architecture.
- ▲ Write new Accessories all your own with the Pinpoint Toolkit.

- ▲ File and command compatible with AppleWorks.
- ▲ Open-Apple command support, with pull-down menus and dialog boxes.
- ▲ Context-sensitive, online help screens.
- ▲ Convenient 'Drag Mode' moves the pop-up menu anywhere on the screen.
- ▲ Customized Pinpoint disks can include one accessory, several, or all as desired to save floppy disk or available RAM disk space.
- ▲ Use with any ProDOS device.
- ▲ Not copy protected.

USE PINPOINT WITHOUT APPLEWORKS

Individual Pinpoint Desktop Accessories can be used as stand-alone applications without AppleWorks, Business Works or other primary application.

Select ProDOS BASIC from the Pinpoint menu to load BASIC. Pressing Open-Apple-P pops-up Pinpoint's main menu. Select the Accessory you wish to run and press RETURN.

Customized Pinpoint Disks

Pinpoint Desktop Accessories may be used individually, or in sets. All accessories are regular ProDOS system files, except the Dialer which is a RAM resident portion of the Pinpoint Dispatcher.

Accessories can be moved to and from any ProDOS 'working disk' to suit your individual requirements. This saves space on your 'working disks' and conserves valuable RAM disk space.

For example, you may wish to include only the Notepad, QuickLabel and Communications Accessories on your AppleWorks Database disks. Or just the Calendar, Notepad, Calculator, Typewriter and QuickLabel Accessories on your Word Processing and Spreadsheet disks. Or just use GraphMerge all by itself.

Copying Accessories

Use ProDOS Filer or Copy II Plus for copying Accessories on floppy disks; or you may use the Pinpoint RAM Enhancement Kit to automatically upload selected Accessories onto your partitioned RAM disk.

PINPOINT'S POP-UP SPELLING CHECKER

One bungled word can spoil your entire document. But not with Pinpoint's pop-up Spelling Checker by your side.

The Spelling Checker is a new optional accessory that is added to the Pinpoint Desktop. Absolutely the most convenient way to produce letter-perfect AppleWorks documents.

The Spelling Checker requires PINPOINT or it will not run. Because the Spelling Checker actually uses AppleWorks' own editing power for automatic on-screen spelling corrections and page reformatting, the Spelling Checker works only with AppleWorks (word processing, spreadsheet and database modules).

Like other PINPOINT Accessories, the Spelling Checker pops-up from inside AppleWorks, ready anytime you want to check your work.

POP-UP SPELLING CHECKER FEATURES

- ▲ Checks documents of any size in memory.
- ▲ 60,000 word dictionary, refined from seven years of extensive use by over 250,000 people. Thorough testing has eliminated thousands of awkward, obscure, and antiquated words that might be incorrectly accepted as properly spelled words.
- ▲ Unlimited word capacity personal dictionary can be used for proper names, specialized terms, and frequently used abbreviations. This dictionary is limited only by ProDOS' 16MB maximum file size or the capacity of your disk.
- ▲ RAM resident Quick-Check list of frequently used words greatly speeds spell checking.
- ▲ Four spell checking codes: check individual words, paragraphs or documents; and optionally, elect not to display alternative spellings (i.e., for classroom use).
- ▲ Spell checking summaries: # words checked, # suspect words, # words corrected, and # added to personal dictionary. Summary display is optional.
- ▲ Configure default mode settings, including sound option, and paragraph/document spell checking summaries.
- ▲ One single-sided Apple 5.25" floppy disk can store the spell checking software, main dictionary and approximately a 3,000 word personal dictionary.
- ▲ One UniDisk 3.5" can store AppleWorks, all eight original PINPOINT Desktop Accessories, the Spelling Checker plus both dictionaries at maximum capacity.
- ▲ For maximum performance, install the Spelling Checker on either a Hard Disk or partitioned RAM Disk using Pinpoint's RAM Enhancement Kit.

*Contact Pinpoint for more information.

USING THE SPELLING CHECKER

- ▲ On command, check individual words, paragraphs or entire documents. Also checks words in spreadsheets and database entries.
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- ▲ Highlight an alternative word, then press RETURN to automatically correct the word in place.
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Pinpoint

The program works so well that after a couple of weeks, your brightest student asks if you can make the computer teach multiplication, too. Since you know something about BASIC, you don't hesitate to give it a try. You know that you can LIST the program, and you'll see the code presented in the accompanying **Program listing**.

Looking at the program, you see that line 10 tells the computer to clear the screen, while lines 20 and 30 generate two random numbers, called X and Y, whose values lie between one and ten. Line 40 "initializes" two other

Program listing. Sample BASIC program.

```
10 HOME
20 X = INT(RND(1)*10 + 1)
30 Y = INT(RND(1)*10 + 1)
40 Z = 0: Z$ = " "
50 PRINT "WHAT IS "X" + "Y" ? ";
60 INPUT " ";Z
70 Z = INT(Z + .1)
80 IF Z <> X + Y THEN PRINT "SORRY, WRONG ANSWER."
90 IF Z = X + Y THEN PRINT "**** GOOD WORK! ****"
100 PRINT
110 PRINT "PRESS <RETURN> FOR ANOTHER PROBLEM."
120 PRINT "PRESS <X> TO STOP."
130 INPUT Z$
140 IF Z$ = "X" THEN END
150 GOTO 10
```

variables to zero and null, which keeps values you type in during one problem from being carried over into the next.

The PRINT command in line 50 displays the problem on screen. See the plus sign in this line? To change the program so that your example is displayed as a multiplication problem, retype line 50, using a multiplication sign (x) instead of the plus sign. This, of course, only changes the displayed question. You know that the INPUT command in line 60 makes the program wait for the student to enter an answer. You also note that the program stores the student's answer as the variable Z, so you aren't surprised that Z also appears in lines 80 and 90.

Line 80 tells the computer to display "Sorry, wrong answer" if the student's response (Z) isn't equal to X plus Y. Line 90 tells the computer to display "**** Good Work! ****" if Z does equal X plus Y. So you realize that you must retype lines 80 and 90, using BASIC's multiplication symbol, which is the asterisk (*), in place of the plus signs.

Having made these three simple changes, you now SAVE the program to disk, using a different name so that the computer doesn't overwrite the old addition program. You now have a program for drill and practice in simple multiplication, and it didn't cost you one penny more!

Editing Your Program

What other changes could you make? Suppose you want to challenge your students further by having the program generate larger numbers. Simply change the number 10 in lines 20 and 30 to, say, 99. The rest of the

program remains unchanged, but it now generates addition problems that use numbers between one and 99.

Do you want to change the computer's responses to the student's answers? Easy—modify the messages inside the quotation marks in lines 80 and 90. Do you want to count the number of problems a student answers correctly? That, too, is easy. Add line 5 to initialize the counter: 5 CT = 0. Then change line 90 to read:

```
90 IF Z = X + Y THEN CT = CT + 1: PRINT "GOOD WORK!
YOU HAVE "CT" CORRECT ANSWERS."
```

Now, feeling full of confidence, you SAVE a subtraction version of the original program in which you've changed the plus signs in lines 50, 80, and 90 to minus signs. But then one of your first-graders tugs at your sleeve. "How can you subtract eight from four?" Whoops! a problem. The second random number generated, Y, must always be less than or equal to X (at least for first-graders). So you LIST your subtraction program, and add line 35:

```
35 IF Y > X THEN GOTO 30
```

That's all there is to it. Your program now compares the values of Y and X, and if Y's value is greater than that of X, the computer generates a different value for Y in line 30. The program compares the values again (line 35), and the cycle repeats itself until the computer produces a valid value for Y.

The above solution to the subtraction problem is the "brute-force" method, but it works just fine. A more elegant solution would be to replace the number 10 in line 30 with the letter X. In this way, the randomly selected value for Y will always be between one and X, and there will be no need to test Y's value.

Conclusion

This sample program is, of course, far simpler than any package you might purchase. But it's useful code that a novice programmer with only a "learner's permit" can write. And it serves to illustrate quite clearly that with some programming knowledge, you have more control over what your computer can do for you.

The home computer is a truly awesome tool. Yet few of us have taken full advantage of the power waiting at our fingertips. The potential to change our lives in ways we can only begin to imagine is right there. We must be willing to invest our time and energy in learning to use this tool effectively if we expect it to help us achieve our goals. And on the way we need to be ready to recognize new paths and opportunities our developing computer skills may open up for us.

Happy programming! ■

See Dan Bishop's monthly column, *Applesoft Adviser*, on page 84 in this issue. Write to him at 4124 Beaver Creek Drive, Fort Collins, CO 80526.

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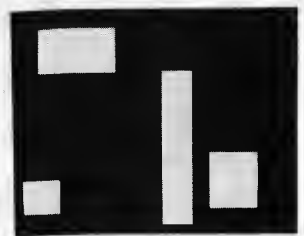
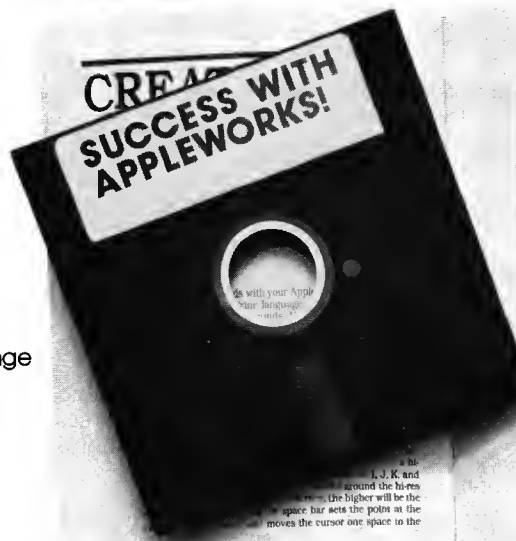


Photo 2. Example using the FILL routine.

SAVE it with different parameters. FILL should be saved so that it doesn't cross a page boundary. Once you relocate FILL, be sure to change the CALL statement to reflect its new location. You will also have to relocate HIMEM to protect the routine in its new location.

When using FILL, be certain that the point you HPLLOT before calling the routine is inside the object you want to fill. If the point lies on the border or outside of an object, you'll get some strange results. ■

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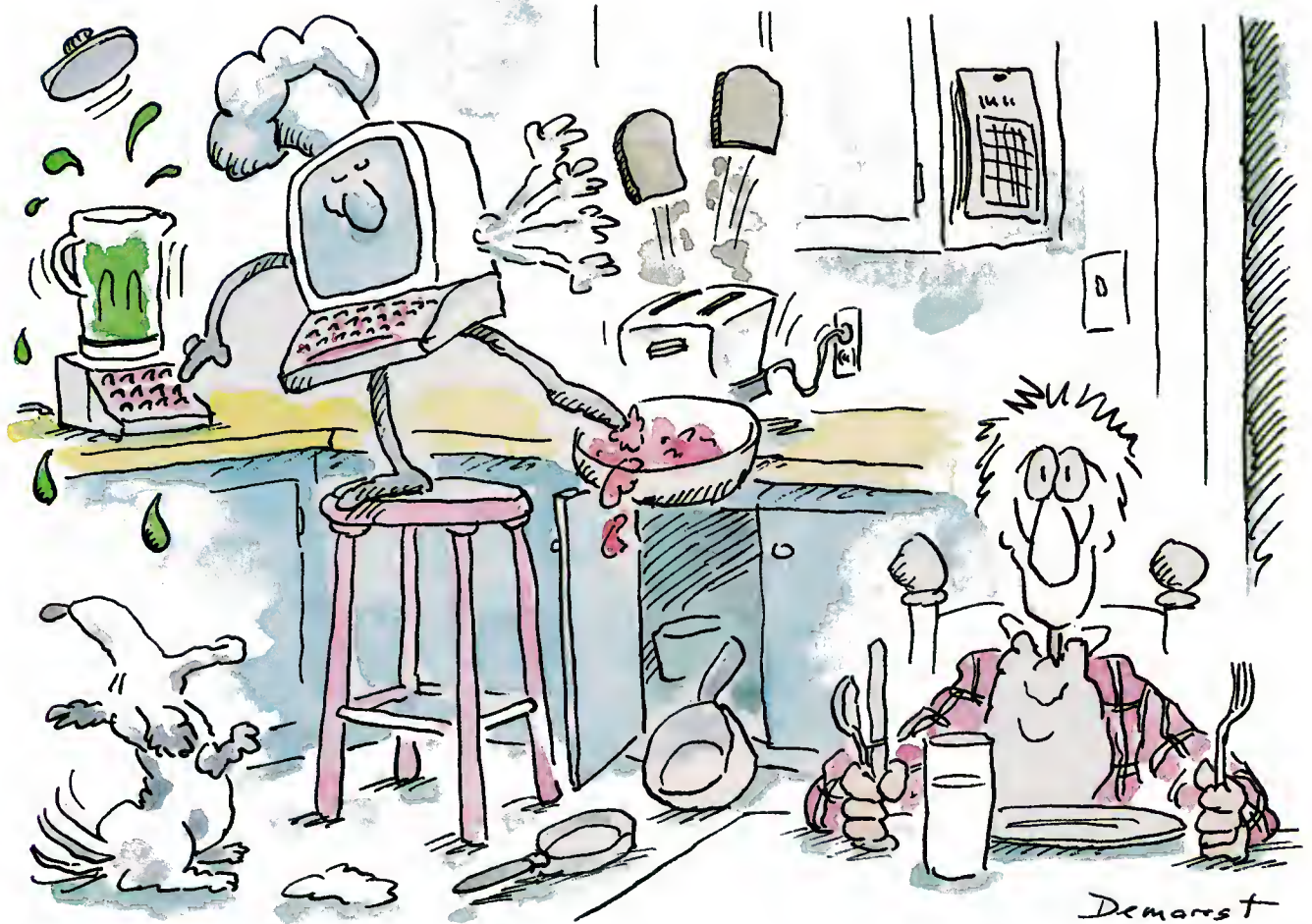
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TEN REASONS NOT TO BUY A COMPUTER

Every once in a while it's good to pause and inject a little levity into the often all-too-serious pursuit of computing. While we at inCider may not agree with all the opinions expressed below, we certainly think they'll spur some humorous debate.

by David Nimmons

After you live with your home computer for a while, you come to realize that its intelligence falls somewhere between that of a toaster and a beagle puppy. This is good to keep in mind, because it will come as less of a shock when you discover that there are some tasks it's unwise to ask your computer to do. As coincidence would have it, many people notice that these are the tasks

they bought their computer to do in the first place.

Having lived with a machine for three years now, I would like to point out ten things computers don't do well at all.

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1) Banking at home by computer is one of those dubious phrases like "trimming six inches from your waistline overnight while you sleep." My research shows only two reasons people go to the bank: To get green paper money they can go out and spend (the first thing home banking can't do), and to physically deposit a paycheck to cover the check they wrote the night before (the other thing a computer can't do).

2) When it comes to listing the century's great orphaned ideas, the computerized checkbook will rank with the lava lamp. What's surprising is that anybody took it seriously in the first place. Consider that my checkbook was given to me free by the bank, has nice pictures of sunsets and waterfalls on the checks, weighs three ounces, measures five inches long, and fits in my pocket. Consider further that it takes 20 seconds to pull out and open this checkbook, write a check, sign it, and enter it in the stubs. Oh, yes, and I need only a pen to operate it.

My computer, on the other hand, cost upwards of \$1000, has no nature pictures anywhere in it, weighs about 12 pounds, and takes up most of my desktop. It requires 90 seconds to turn it on, find the right floppy disk, and load and access the checkbook program. I then have to find all the stubs of the receipts I wrote this month, type in the year, month, and day in numbers separated by slashes (I usually have to delete at least one line of the check because I made a mistake), exit the writing mode, turn on the printer, enter the print mode, find my checkbook, insert a check in the printer, and start it.

3) "Family-budget spreadsheet" programs exist because somewhere along the line software makers got confused between the "American family" and the "limited partnership." If they had their way, families would stop pasting up their albums and start issuing annual reports.

What the software people seem to have forgotten is that family finances are the single most persuasive argument for entropy yet known. The family budget, if it exists at all, consists of eight months' worth of bank statements thrown in a corner, some numbers scratched on old bank envelopes, and a limbic sense of how near the Ultimate Line is. Note that I've said nothing about recalculated, column-logic variable summing, internal rate of return, or projected mortgage scenarios at three hypothetical interest rates plotted in four-color graphs. In short, these programs are the

software equivalent of a thermonuclear flea collar: impressive, but rarely worth the trouble.

4) Next we come to the computerized electronic calendar. It doesn't let you make dates; you make "events." Can you imagine saying, "We fell in love on our first event?"

Worse, it suffers from that picky literal-mindedness of machine-think. For me, as for most folks, time unravels in a drinks-with-Chris-late-next-week sort of way. Electronic calendars are not that loose. To them, "late next week" means nothing. "Noonish" means nothing. They don't even know about "happy hours." But "07-08-86, 6:00 P" they understand. No wonder we don't get along.

5) The computerized address book is only slightly more useful, with spaces limited to name, address, zip code, and phone. I'm the type to jot entire dossiers on those tiny pages: birth dates, shirt sizes, the name and weekend phone number of my current Significant Other. Sometimes it's quite personal: "Hates pasta," "Don't mention Yankees," "Husband's an idiot," stuff like that. If I relied only on what I could put into the electronic address book, my personal relationships would fall apart.

6) Next there's the home-computer control center, the command central that knows when to turn on lights and lawn sprinklers, lower the thermostat, guard against intruders, call the police, teach the kids, inventory the kitchen, clean the bathroom, and water the poinsettia.

It's all very Buck Rogers, like air cars and dematerialization beams, and people like that sort of thing. But it boils down to this: Do you want to hand over control of your house to the same machines that keep sending those bills for charge accounts you never had?

7) Telecommunicating with friends over the phone is a fascinating use for your \$1000-plus computer. First you have





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to think of people you know who have a modem that allows them to communicate, and if you have any desire to "chat" with them. The next step is to call them up and see if they want to talk to you. Usually you talk for a few minutes to answer a few basic questions: Will you communicate in full, half-duplex, or simplex mode? What baud rate will you use? What kind of parity check? Who's in transmit and who's in receive mode? Simple, huh? Now hang up. Load your machine with the proper software and program it to dial your friend. Presto! You're ready to have a computer chat:

HI, EDDIE?
 —HAVE YOU STARTED?
 HELLO, EDDIE.
 —CAN YOU READ ME?
 YES, IS YOURS ALL IN BIG LETTERS?
 —WHAT?
 PLS. REPEAT.
 —I DON'T UNDERSTAND. IT'S YOUR TURN.
 REPEAT.
 —WHAT?
 OOPS. . .
 Connection interrupted.

8) A subset of this silliness involves phone-line news services. The idea is for a small connect fee (roughly equivalent to the national debt of Ireland) you can snuggle up to the great electronic-information teat of news services like Dow Jones or UPI and be the first on your block to read the day's fast-breaking stories on, say, disposable paper products, dolphin research, or the situation in Lapland.

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9) The next most oversold computer idea is speech synthesis. A talking computer, say the yahoos, is a Helpful Thing. Didn't anybody else see *2001: A Space Odyssey*? Remember how much wonderful help they got from HAL?

Not only does a computer take three times as long to organize your calendar, checkbook, and banking, but now it will nag you about the results. Recently, I tried to convince my 5-year-old niece how much fun a talking computer could be. I'd spent all day programming, testing, and debugging when her small, blonde head brushed my arm. "What does that toy do?" she asked.

Triumphant, I started the routine. "Hello, what's your name?" croaked the \$1000 machine. "I love you," it quaked. I beamed.

Without a word, my niece disappeared, then came back a minute later dragging her favorite doll by one leg. Taking her thumb from her mouth, she picked up the doll and pulled its ring. "Hello, what's your name?" it chirped. She pulled it again: "I love you." Then she looked at the computer expectantly: "Make it wet its pants."



10) Whoever thought up the electronic cookbook should be hoisted on his own paté. Ask yourself whether your \$1000 piece of sophisticated microelectronics was designed to deal with spilled apricot juice, spattering bacon drippings, whole-wheat flour, and melted chocolate. It turns out computer technicians get testy when they find things like vegetable shortening inside your machine's RS-232 port.

Electronic cookbooks are supposed to be great for expanding or contracting recipes. This feature is quite useful for those occasions when your Significant Other calls to say the 5th Airborne Division is coming to dinner and your Shrimp Gelée à la Turque recipe feeds only five. If you don't routinely cook for armies, or hospitals, however, it won't do you much good. Every cook worth his capers knows that halving the yeast in bread with only half as much everything else gives it the consistency of steel. And how does one add 2.3 eggs? ■

David Nimmons, former speech writer for Geraldine Ferraro, is a free-lance writer and avid computer user.



Ten Reasons to Buy a Personal Computer

I can't argue with the facts: It's easier to write your friends in Fresno a letter than to telecommunicate. And recipe files are only a rationalization for the computer you already bought. But that doesn't mean you shouldn't buy a personal computer.

If I were looking for a reason to buy a home computer, I'd find some things I couldn't do without a computer. And there are many.

Take **word processing**, for instance. Writers who convert from a typewriter never go back: Word processing is easier, and many writers say it makes them better at their craft. Find a word processor that works the way you do, or make one. Buy a programmable word processor such as Apple Writer, which lets you have it your way, as does the SwyftCard if you learn BASIC. A programmable word processor takes the canned application (one that meets general needs) and tailors it to your liking. It's like eating canned beans brightened with fresh basil—it hides the taste of the can.

A canned program is essential, though, if you need **integrated software**—a word processor combined with a filing system and spreadsheet for businesses or busy families. You can't integrate a stack of letters and a shoebox full of canceled checks. But AppleWorks' interface is easily understood—that is, it makes sense—and it puts all your information together.

If you have AppleWorks at home, consider Quicken, a **check-writing** program that's impressive in its speed and ease of use. If you're already running AppleWorks, all the numbers are already there. So why not let the computer write the checks?

Of course, help with your **finances** is another reason to buy a computer. From on-line information from the Dow Jones News/Retrieval Service to tax-preparation packages, the computer can really help you keep an eye on things. It won't keep you solvent, but at least you'll know where your money is—or isn't.

And what about your **will**? You're going to need one someday, and WillWriter makes one for you without a lawyer. That's a reason to buy an Apple.

Not much for writing? You can **print** newsletters, birthday cards, banners, and so on at home with The Print Shop and The Newsroom. These two products make you a publisher overnight. Fantavision, an **animation** tool, makes you a moviemaker—like Walt Disney, and just as quickly.

Simulation games let you pretend you're almost anyone—a medieval wizard, a private eye in a black-and-white movie, or a circus clown. Players swear by Infocom's interactive fiction, Ultima fantasy by Lord British at Origin Systems (distributed by Electronic Arts), and the Wizardry series from Sir-Tech.

The **KoalaPad** is reason enough to buy an Apple. It works with Dazzle Draw as well as Fantavision, and holds your hand steady enough to scratch out a straight line on the video display.

A Fischertechnik **robot kit** from Germany requires an Apple IIe to build traffic lights, solar panels, and industrial arms. This erector set for grownups might persuade you to purchase an Apple—and it makes a great excuse to present a young scientist with one.

The tenth reason to buy a home computer is **programming**. You can teach yourself BASIC or your kids Logo. Programming is the logically radical extreme of logic: It may be more reason than you want or need, but you can't program without a computer—and that's the last word. □

—Paul Statt

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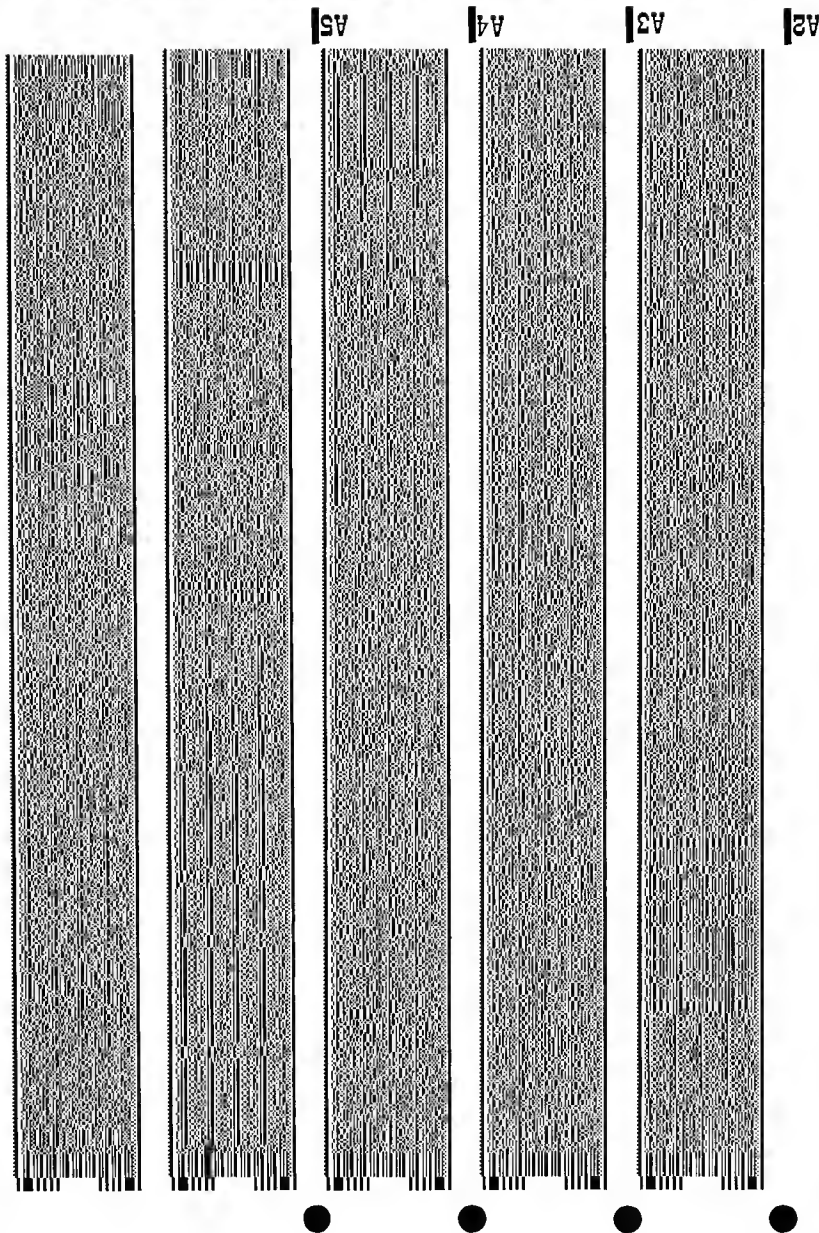
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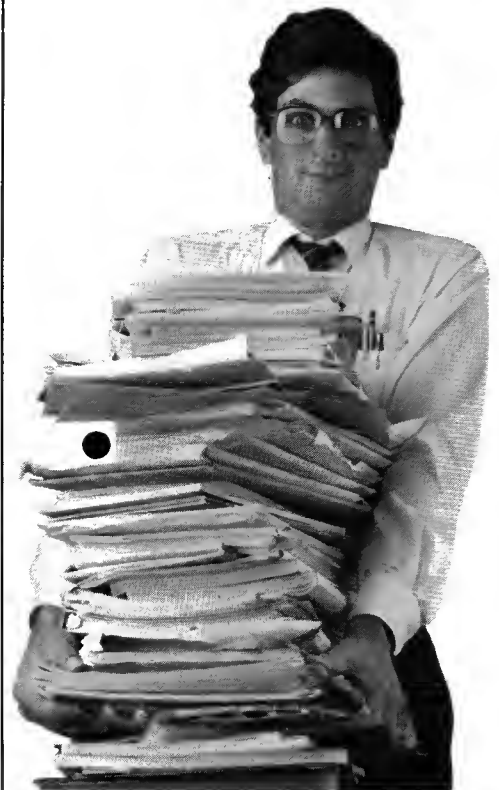
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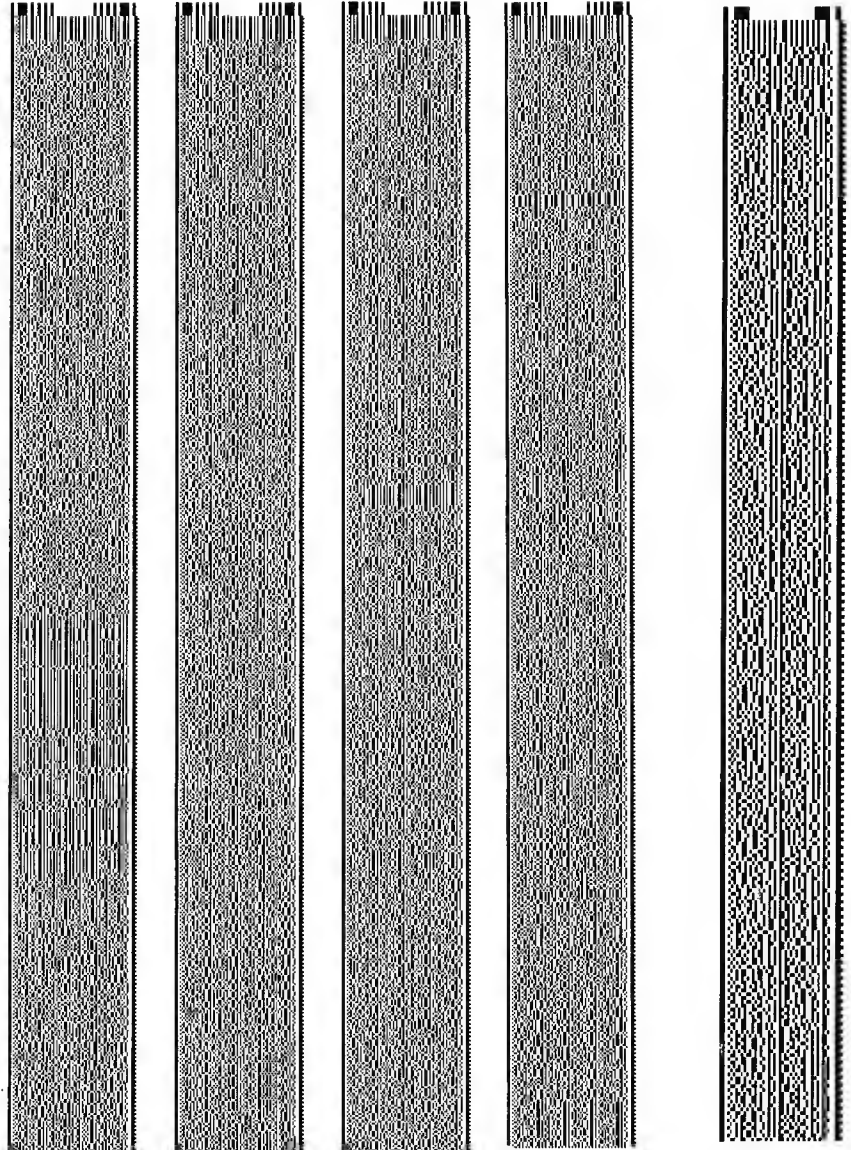
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B1

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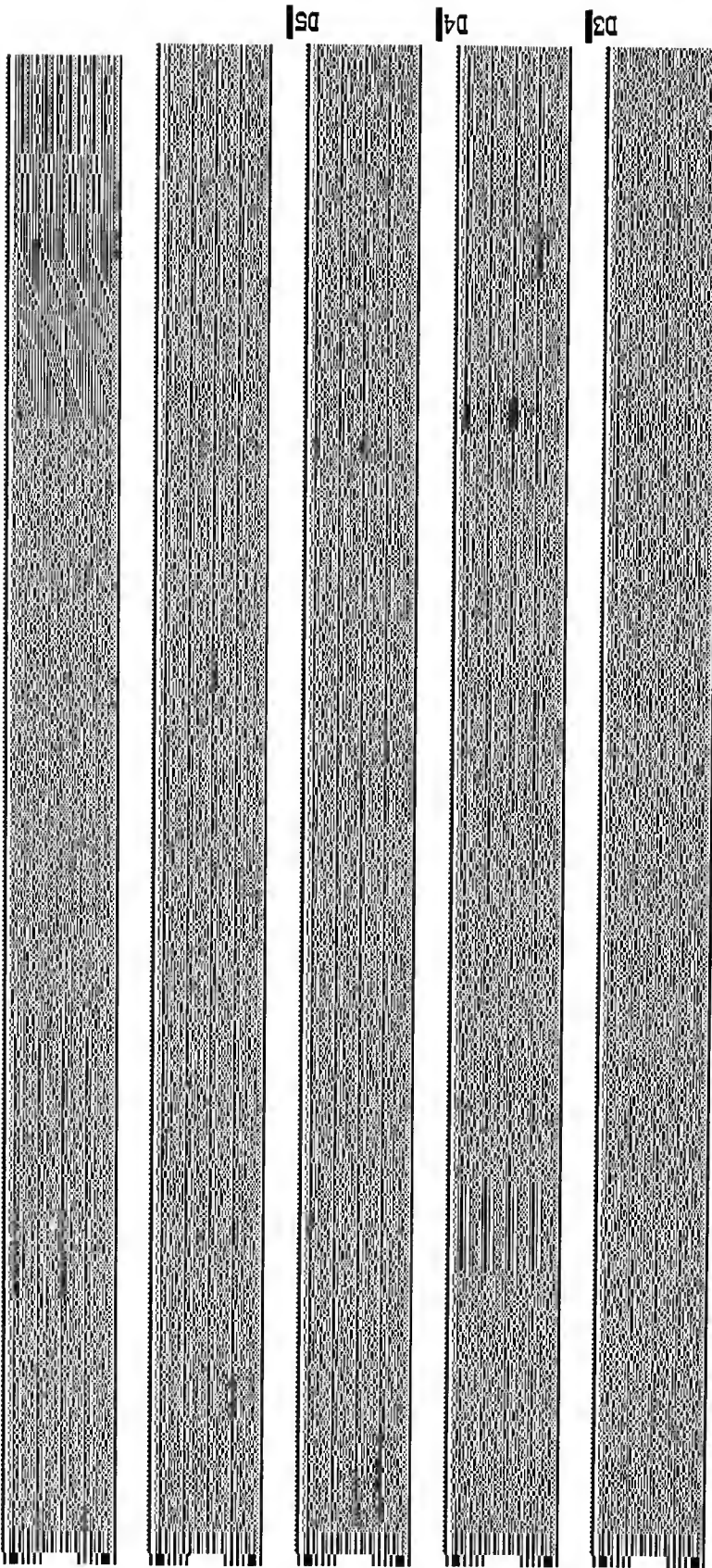
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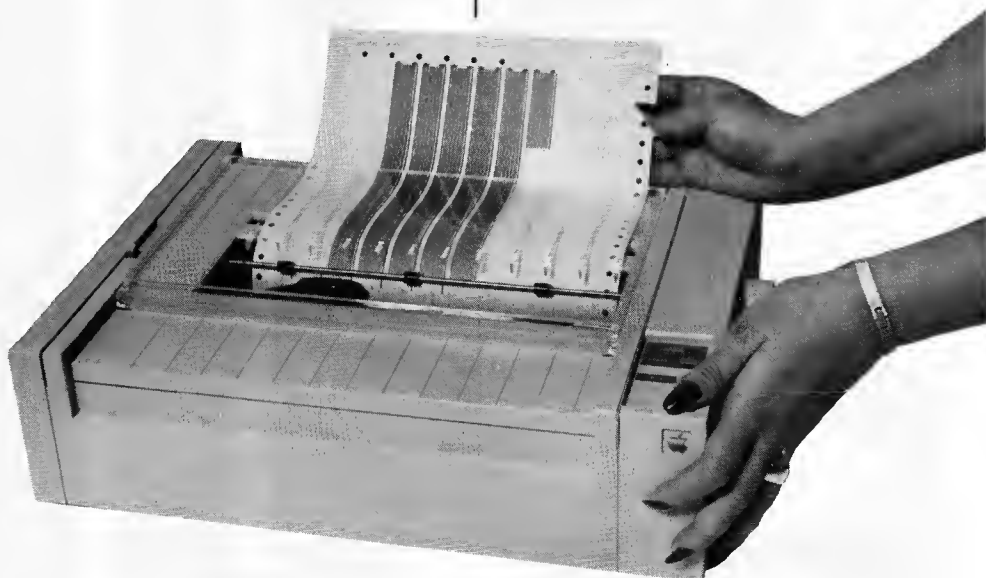
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APPLEWORKS IN ACTION

Making Decisions with Price-Volume Analysis

by Ruth K. Witkin

Highest price equals greatest profit—right? Well, not necessarily. If your price is too high, sales volume can plummet. If you set too low a price, you may sell in greater quantity but not cover your costs. Price-volume analysis can help you strike the right balance.

Let's suppose you run the Johnson Toy Manufacturing Company. Your latest product is a programmable rubber duck. You expect strong interest in the marketplace. But what's the best selling price?

Figure 1 shows the price-volume spreadsheet. The numbers in rows 3 to 8 are your "what-if" playground. When you enter the fixed and variable costs of the duck, a starting price, starting volume, price increase, and how much that price increase reduces volume, the formulas calculate the volume, fixed costs per unit, total variable costs, sales income, total profit, and profit per unit in each of four price-volume tests.

In this session, you use the Window command, which lets you keep two distant areas of a spreadsheet on screen at the same time. While you work in one window, you can view the results in the other.

A Spreadsheet from Scratch

When you see such key combinations as OA-L, hold down the open apple key and type L. If you make a typo, press the delete key to back up the cursor and erase.

If you save to disk with a one-drive system, watch the screen for prompts that tell you when to swap the program disk for the data disk.

Use the AppleWorks Startup and Program disks to bring up a new spreadsheet screen. Name this file **PV ANALYSIS**. You should now see the Review/Add/Change screen.

Dashed lines make a spreadsheet easier to read. But putting several lines across many columns can be tedious. A simple technique is to enter one line and use the clipboard to enter the rest. Here's how to do it:

First, enter a line across row 2: Place the cursor on A2 and type quotation marks. Now hold down the

What's the best selling price?
Find out with price-volume
analysis and your AppleWorks
spreadsheet.

equal-sign key until the sign reaches the right edge of E2. Press Return.

Now copy row 2 to the clipboard. Leave the cursor on A2 and press OA-C, type T, and press Return. Next, copy the row from the clipboard and insert it before row 9: Place the cursor on A9, press OA-C, and type F. You can't see it now because the spreadsheet is empty, but you just inserted a whole new row.

And finally, insert a row before row 23: Place the cursor on A23, press OA-C, and type F.

Use a minus sign to enter the line in row 11: Place the cursor on A11, type quotation marks, hold down the minus-sign key until the sign reaches the right edge of E11, and press Return.

Use the following summary to set up the rest of the spreadsheet so that it looks like the one in **Figure 2**:

Column Widths. Each column is now nine characters wide. Use the Layout command (OA-L) to increase the width of column A by 17 characters and columns B-E by two each.

Labels. Enter the spreadsheet title in

B1, the labels in column A, and the Test labels in B10 to E10. Use OA-L to right-justify the Test labels.

Numbers. Most of the numbers are dollar amounts, but dollar signs often crowd a spreadsheet. Instead, use the Value command (OA-V) to set a standard value of Commas with zero decimal places. Then use OA-L to put the following cells into a Commas format with two decimal places: B3 and B4, B8, B12 and C12, B14, and B22. The format is copied into the other cells when you copy the formulas.

Short Line. In B20, type quotation marks, press the space bar, type nine minus signs, and press Return. This line is also copied into the other columns with the formulas.

Now press OA-S to save.

Figure 3 shows the formula locations. First, read how the formula works. Then place the cursor on the cell receiving the formula. Move the cursor to the cell locations shown in the formula description and type everything else. When the formula is complete, press Return. If you have a problem building a formula, press the escape key and start again.

Formula 1: Selling Price per Unit (Test 1)

Formula 1 doesn't calculate anything. It just copies the number from

Figure 1. AppleWorks spreadsheet used for price-volume analysis.

| | A | B | C | D | E |
|-----|---------------------------|---------|---------|---------|---------|
| 11 | PRICE-VOLUME ANALYSIS | | | | |
| 21 | | | | | |
| 31 | Selling Price per Unit | 22.75 | | | |
| 41 | Selling Price Increase | 1.00 | | | |
| 51 | Volume in Units | 12,000 | | | |
| 61 | Volume Decrease | 650 | | | |
| 71 | Total Fixed Costs | 26,500 | | | |
| 81 | Variable Costs per Unit | 7.50 | | | |
| 91 | | | | | |
| 101 | Price-Volume Calculations | Test 1 | Test 2 | Test 3 | Test 4 |
| 111 | | | | | |
| 121 | Selling Price per Unit | 22.75 | 23.75 | 24.75 | 25.75 |
| 131 | Volume in Units | 12,000 | 11,350 | 10,700 | 10,050 |
| 141 | Fixed Costs per Unit | 2.21 | 2.33 | 2.48 | 2.64 |
| 151 | Total Fixed Costs | 26,500 | 26,500 | 26,500 | 26,500 |
| 161 | Total Variable Costs | 90,000 | 85,125 | 80,250 | 75,375 |
| 171 | | | | | |
| 181 | Sales Income | 273,000 | 269,562 | 264,825 | 258,788 |
| 191 | Cost of Goods Sold | 116,500 | 111,625 | 106,750 | 101,875 |
| 201 | | | | | |
| 211 | Total Profit | 156,500 | 157,938 | 158,075 | 156,912 |
| 221 | Profit per Unit | 13.04 | 13.92 | 14.77 | 15.61 |
| 231 | | | | | |

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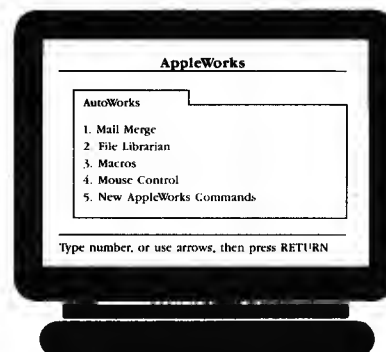
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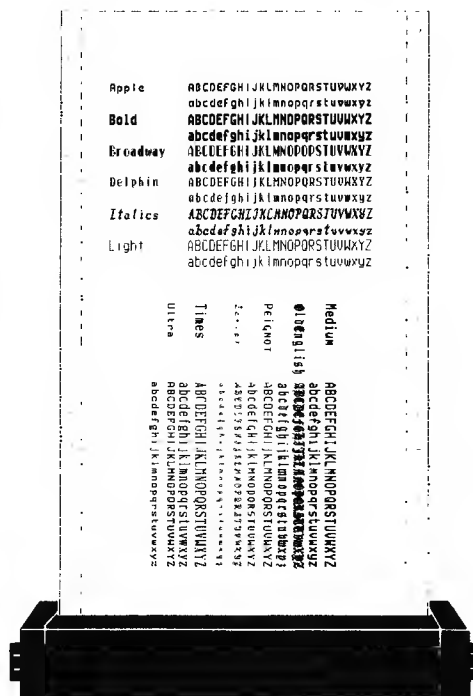
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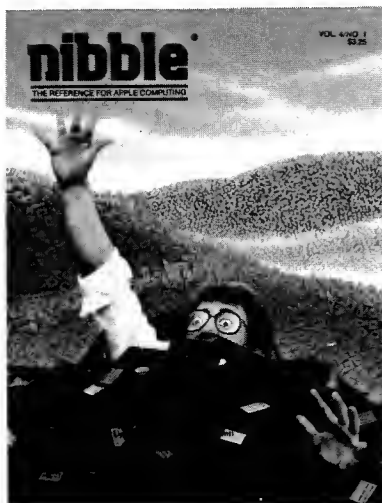
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APPLEWORKS IN ACTION

B3 into B12, the selling price per unit in Test 1.

Cell Location: B12

Description: + B3

Formula 1 has no numbers to work with, so zeros appear.

Formula 2: Volume in Units (Test 1)

Formula 2 works the same as Formula 1, this time copying the volume in units from B5 into B13.

Cell Location: B13

Description: + B5

Formula 3: Fixed Costs per Unit

Formula 3 divides the total fixed costs (B7) by the volume in units (B13) and enters the fixed costs per unit in B14.

Cell Location: B14

Description: + B7/B13

You asked Formula 3 to divide by zero, which it cannot do, so ERROR appears and will remain until you enter the practice numbers.

Formula 4: Total Fixed Costs

Formula 4 copies the total fixed

Figure 2. Labels and lines in an AppleWorks price-volume analysis spreadsheet.

| | A | B | C | D | E |
|-----|---------------------------|--------|--------|--------|--------|
| 11 | | | | | |
| 21 | | | | | |
| 31 | | | | | |
| 41 | | | | | |
| 51 | | | | | |
| 61 | | | | | |
| 71 | | | | | |
| 81 | | | | | |
| 91 | | | | | |
| 101 | Price-Volume Calculations | Test 1 | Test 2 | Test 3 | Test 4 |
| 111 | | | | | |
| 121 | Selling Price per Unit | | | | |
| 131 | Volume in Units | | | | |
| 141 | Fixed Costs per Unit | | | | |
| 151 | Total Fixed Costs | | | | |
| 161 | Total Variable Costs | | | | |
| 171 | | | | | |
| 181 | Sales Income | | | | |
| 191 | Cost of Goods Sold | | | | |
| 201 | | | | | |
| 211 | Total Profit | | | | |
| 221 | Profit per Unit | | | | |
| 231 | | | | | |

costs from B7 to B15.

Cell Location: B15

Description: + B7

Formula 5: Total Variable Costs

Formula 5 multiplies the variable

costs per unit (B8) by the volume in units (B13) and enters the total variable costs in B16.

Cell Location: B16

Description: + B8*B13

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APPLEWORKS IN ACTION

Formula 6: Sales Income

Formula 6 multiplies the selling price per unit (B12) by the volume in units (B13) to produce the sales income (B18).

Cell Location: B18

Description: $+B12*B13$

Formula 7: Cost of Goods Sold

Formula 7 adds the total fixed costs (B15) and total variable costs (B16) to produce the cost of goods sold (B19).

Cell Location: B19

Description: $+B15+B16$

Formula 8: Total Profit

Formula 8 subtracts the cost of goods sold (B19) from the sales income (B18) to produce the total profit (B21).

Cell Location: B21

Description: $+B18-B19$

Formula 9: Profit per Unit

Formula 9 divides the total profit (B21) by the volume in units (B13) to produce the profit per unit (B22).

Cell Location: B22

Description: $+B21/B13$

ERROR appears because you are again asking a formula to divide by zero.

Figure 3. AppleWorks price-volume analysis spreadsheet showing formula locations.

| | A | B | C | D | E |
|-----|---------------------------|--------|--------|--------|--------|
| 11 | | | | | |
| 21 | | | | | |
| 31 | | | | | |
| 41 | | | | | |
| 51 | | | | | |
| 61 | | | | | |
| 71 | | | | | |
| 81 | | | | | |
| 91 | | | | | |
| 101 | Price-Volume Calculations | Test 1 | Test 2 | Test 3 | Test 4 |
| 111 | | | | | |
| 121 | Selling Price per Unit | 0.00 | 0.00 | 0.00 | 0.00 |
| 131 | Volume in Units | 0 | 0 | 0 | 0 |
| 141 | Fixed Costs per Unit | ERROR | ERROR | ERROR | ERROR |
| 151 | Total Fixed Costs | 0 | 0 | 0 | 0 |
| 161 | Total Variable Costs | 0 | 0 | 0 | 0 |
| 171 | | | | | |
| 181 | Sales Income | 0 | 0 | 0 | 0 |
| 191 | Cost of Goods Sold | 0 | 0 | 0 | 0 |
| 201 | | | | | |
| 211 | Total Profit | 0 | 0 | 0 | 0 |
| 221 | Profit per Unit | ERROR | ERROR | ERROR | ERROR |
| 231 | | | | | |

Formula 10: Selling Price per Unit (Test 2)

Formula 10 increases the selling price in Test 2 (C12) by the amount in B4 and enters the result in C12.

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Figure 4. Practice entries in an AppleWorks price-volume analysis spreadsheet.

| | A | B | C | D | E |
|-----|---------------------------|--------|--------|--------|--------|
| 11 | | | | | |
| 21 | | | | | |
| 31 | Selling Price per Unit | 22.75 | | | |
| 41 | Selling Price Increase | 1 | | | |
| 51 | Volume in Units | 12000 | | | |
| 61 | Volume Decrease | 650 | | | |
| 71 | Total Fixed Costs | 26500 | | | |
| 81 | Variable Costs per Unit | 7.5 | | | |
| 91 | | | | | |
| 101 | Price-Volume Calculations | Test 1 | Test 2 | Test 3 | Test 4 |
| 111 | | | | | |
| 121 | Selling Price per Unit | | | | |
| 131 | Volume in Units | | | | |
| 141 | Fixed Costs per Unit | | | | |
| 151 | Total Fixed Costs | | | | |
| 161 | Total Variable Costs | | | | |
| 171 | | | | | |
| 181 | Sales Income | | | | |
| 191 | Cost of Goods Sold | | | | |
| 201 | | | | | |
| 211 | Total Profit | | | | |
| 221 | Profit per Unit | | | | |
| 231 | | | | | |

Cell Location: C12
Description: + B12 + B4

Formula 11: Volume in Units (Test 2)

Formula 11 decreases the volume in Test 2 (C13) by the amount in B6

and enters the result in C13.
Cell Location: C13
Description: + B13 - B6

Copying Formulas 10 and 11


Formulas 10 and 11 can calculate

the selling price and volume in Tests 3 and 4. Follow these steps to start the Copy command, confirm *Within worksheet*, highlight C12 and C13 (the cells to copy from), and tell AppleWorks to copy into D12 and E12: Place your cursor on C12 and press OA-C. Now press Return, press the down arrow key, and press Return again. Press right arrow, type a period, press right arrow, and press Return.

AppleWorks highlights B12 and asks if it is a *No change* or *Relative* reference. To select *No change*, you press Return; to select *Relative*, you type **R**. To identify B12 as relative, type **R**. In turn, as the other cells are highlighted, press Return, type **R**, and press Return again.

Copying Formulas 3 to 9

The next step is to copy Formulas 3 to 9 (B14 to B22) and the line in B20 into Tests 2, 3, and 4. Place the cursor on B14 and press OA-C. Now press Return, press OA-9, and press Return again. Press the right arrow key, type a period, press OA-right ar-



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row, and press Return.

AppleWorks now asks if B7 is *No change* or *Relative*. It's *No change*, so press Return. As the other cells are highlighted, follow this sequence to tell AppleWorks which cell reference is which: Type **R**, press Return twice, and type **R** (9 times). This completes the formulas. Press OA-S to store the spreadsheet on disk.

Figure 4 shows the practice numbers. The total fixed costs of this product, \$26,500, and the variable costs per unit, \$7.50, are facts that come from financial reports.

Press OA-2 to jump the cursor to B3. Type **22.75** and press the down arrow key. Type the other numbers in B4 to B8 and press the down arrow key after each one. Because of the formatting you did earlier, AppleWorks produces the commas and decimal places. Your spreadsheet should now look like the one in **Figure 1**. These results are interesting. Though Test 4 shows the highest profit per unit, the pairing of price and volume in Test 3 shows the greatest profit potential. To

protect the formulas against change, press OA-5 to jump the cursor to row 12. It should be on B12. Press OA-L. Type **B**, press OA-8, then press down arrow twice. Press OA-right arrow, press Return, and type **PN**.

Next, prepare the spreadsheet for printing. Leave your cursor on B12. Follow these steps to bring up the Printer Options screen and set the left margin so the spreadsheet is centered: Press OA-O, type **LM**, press Return, type **.5**, and press Return.

Now press OA-S to save the spreadsheet and return to the Review/Add/Change screen. Turn on your printer and follow these steps to start the Print command, confirm *All*, select the printer, enter a date, and confirm one copy: Press OA-P, press Return, press Return (or type a printer number, then Return), type today's date, and press Return twice.

When you work with the "what if's", you can't see the effect on profits unless you move the cursor to row 22. But when you move it to row 22, you can't work with the "what if's."

Opening another window solves the dilemma. Here's how to do it:

First, press OA-1 to jump the cursor to row 1. You want rows 3 to 8 and rows 21 and 22 on the screen at the same time. Use the down arrow key to move the cursor to row 20. Row 3 should now be at the top.

Now place the cursor on row 9. Start the Window command and select *Top and bottom* by pressing OA-W and typing **T**. Move the cursor to B22. Both areas are on screen.

Press OA-J to jump the cursor into the top window. Change any numbers in B3 through B8 and watch the formulas go to work. When you're finished, close the second window: Leave your cursor where it is, press OA-W, then press Return. If you save the spreadsheet with a second window, it will have the window in place the next time you load it. The printed spreadsheet, however, won't show even a trace of another window. ■

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|---------------------|-----------|-----|---------|---|
| • COUNT | WORD | • 1 | WORK | • |
| • 10 | A | • 1 | WRITING | • |
| • 1 | ADDRESS | • 9 | YOU | • |
| • 1 | ADDRESSES | • 1 | YOU'VE | • |
| • 6 | ALL | • 8 | YOUR | • |
| • 1 | ALMOST | • | | • |
| • 1 | ALWAYS | • | | • |
| • TOTAL WORDS : 402 | | | | • |
| • CHARACTERS : 2013 | | | | • |
| • CHARS/WORD : 5.0 | | | | • |

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APPLESOFT ADVISER

Line-Graph Generator

by Dan Bishop

Last month I presented Bar Builder II (*inCider*, May 1986, p. 85), a BASIC program for displaying data with bar graphs. That program uses low-resolution graphics, which is ideal for the "blocky" graph-construction needs of bar charts, or histograms. Histograms find their greatest use in situations in which you must compare actual values of related data from two or more sets.

You'll often be more interested in the changes between data points in a specific set of data, however. If you're following the performance of a specific stock on Wall Street, for example, you need a graphic representation that clearly reveals the changes in that stock's price, so that you can identify trends and decide whether to buy or sell. For this kind of application, line graphs are superior to bar graphs, and in this month's column I'll show you how to convert May's Bar Builder II program to plot line graphs.

The low-resolution graphics mode used for bar graphs will not provide the professional-looking, "smooth-line" display necessary for line graphs, though. By turning to high-resolution graphics, you can increase the horizontal resolution of the screen from 40 points to 280 points and the vertical resolution from 40 points to 160 points, while still leaving room for four lines of text at the bottom of the screen. This means that you can plot more points across the screen, and that each point is smaller. With smaller points, diagonal lines appear smoother, avoiding the "stair-step" appearance of low-resolution graphics.

Converting Bar Builder II to Line Graphics

If you've been following my last two columns, you'll be pleased to find that the only subroutines you need to replace in Bar Builder II are those that generate the display. Minor modifications are needed at other points, but for the most part, the data-handling subroutines are the same. You can save time typing in the **Program listing** (p. 88) by loading Bar Builder II, making the necessary alterations,

Modify Bar Builder II to generate line graphs with high-resolution graphics.

then saving it back to disk with a different name. Go through the program line by line, and change, delete, or add lines as needed until the program in your computer matches the one shown in the **Program listing**. Save the result as Line Graph. You now have both Bar Builder II and Line Graph saved to disk.

The first modifications you'll find are in the variable-initialization subroutine in lines 100-170. The program doesn't dimension any arrays for margin size, bar width (distance between the points), or color code; Line Graph calculates them uniquely for each graph it draws (lines 12450-12490). Since high-resolution graphics allows four colors (including black), Line Graph assigns one of two alternating colors to each line. This is the same approach used in the original Bar Builder program (*inCider*, March 1986, p. 92). Lines 110, 120, and 160 have been deleted.

(Note: To delete a line from a program listing, just type in the offending line number and press the return key. To delete a block of consecutive lines, type in DEL followed by the first and last line numbers in the block, separated by a comma, and press Return.)

The subroutine in lines 300-390 isn't needed in Line Graph and has been removed entirely. The range for the allowed number of data points has also been changed from 1-39 to 2-39, since you need at least two points to construct a line. This affects lines 10100, 10120, and 10130. Note that lines 10120 and 10130 have been reversed in Line Graph, to eliminate the need to test for a "1" being entered.

Adding High-Resolution Graphics

The HGR command, added in line 3000, initiates high-resolution graphics. Prior to drawing any graph, Line Graph constructs a border around the screen (lines 3000-3060), then switches the display from text mode

to high-resolution graphics mode and clears the hi-res screen to black. One major difference between HGR and GR (for lo-res graphics) lies in the way they work. Unlike GR, which leaves the bottom four lines of the screen open for text, HGR uses the full screen for graphics. To reserve four lines at the bottom of the screen for text, use POKE -16301,0.

Using the HCOLOR command, now set the color of the next points or lines to be drawn. Instead of values zero through 15 available for colors (as in lo-res graphics), you can use only values zero through 7, and the colors you choose for a given display must be in the zero to 3 range or the 4 to 7 range. Colors zero and 4 correspond to black; colors 3 and 7 correspond to white. Line 3010 sets HCOLOR equal to 3 for the border.

Plotting Points with HPLOT

The only additional command you need for hi-res graphics is HPLOT. To plot a point on the screen, use HPLOT x,y, where x is a number between zero and 279 that gives the horizontal location of the point on screen, and y is a value between zero and 159 (191 if you're using full-screen graphics) that denotes the vertical position for the point.

To plot a series of points in a straight line, use the HPLOT command with the word TO separating the x,y values for the starting and ending points of the line. For example,

```
HPLOT 25,12 TO 55,12
```

plots a horizontal line along row 12 between columns 25 and 55;

```
HPLOT 17,88 TO 17,159
```

plots a vertical line along column 17 (x=17) from row 88 to row 159; and
HPLOT 0,0 TO 279,159

plots a diagonal line from the upper left corner of the screen to the bottom right corner. Finally, an HPLOT command can have as many TO additions as needed, letting you connect lines end-to-end to draw figures. Line 3020 in the **Program listing** draws a box around the display screen:

```
HPLOT 0,0 TO 279,0 TO 279,159 TO  
0,159 TO 0,0
```

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To convert Bar Builder II to Line Graph, delete lines 12405-12750 and type in these lines directly from the **Program listing**, since they're quite different for the hi-res line-drawing function. Notice that Line Graph can normalize vertical distance to fill a 160-point column, while Bar Builder is restricted to 37 points. The greater resolution in hi-res mode is also apparent in lines 12450-12480 where the optimum margin and width (dis-

tance between points) are calculated.

The last major difference between Bar Builder II and Line Graph appears in the Plotter routine (lines 12500-12650). Bar Builder constructs the bars for the first point of each set before going on to the second point. Line Graph plots all of the points in the first set before going on to the second set. In Bar Builder II, the FOR...NEXT loop (loop H) controlling the data-point counter is the outer loop, while the J loop that controls

the set counter is the inner loop. In Line Graph, the order of the inner and outer FOR...NEXT loops is reversed, so that all the points for each set will be graphed together.

Running the Program

Line Graph begins by asking you to type in the number of data sets you want to plot (one to four) and the number of points in the largest set (two to 39). (Typing a zero in response to the second question ends the program.) The program then prompts you to type in three lines of text, which will appear at the bottom of the graph display. Simply press the return key to leave the line blank. To center text on the display line, place your entry in quotation marks and type in the appropriate number of spaces before the text.

Now type in the data points you want to graph. As listed, Line Graph uses the same approach as Bar Builder II, in which you type in all of the first data points for each set before going on to each set's second data points. If this is inconvenient for the data you're using, simply switch lines 12020 and 12030, and change line 12060 to NEXT I,J.

As with Bar Builder II, you can subtract a common value from all of the points in a given set to bring that set's data points into the same vertical range as those of the other sets. If you use this option, remember that the vertical-value relationships between the lines graphed are different.

Line Graph gives you an opportunity to modify any of the data elements or correct typos. It then displays the graph, with a command line at the bottom of the screen that asks you to enter C to continue or E to end the program. Pressing C lets you change any of the data points before redisplaying the graph. You can also alter the "subtraction factor" for any set during this process, by electing to change element zero in the desired set.

Conclusion

Next month, I'll take a new approach, directed toward beginning programmers and covering the basics of Applesoft BASIC. The first thing we'll do is turn your Apple into an interactive five-function calculator, and in the process learn a few elementary commands and expressions. ■

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Program listing. Line Graph.

```

5 REM
6 REM *****
7 REM LINE GRAPH GENERATOR
8 REM MAIN PROGRAM
9 REM *****
10 TEXT : HOME
20 GOSUB 10000: IF N = 0 THEN 90
25 GOSUB 1300
30 GOSUB 12300: GOSUB 12500
40 INPUT "CONTINUE <C> OR END <E>...";X$
50 IF X$ < > "C" AND X$ < > "E" THEN 40
60 IF X$ = "E" THEN 90
70 TEXT : HOME : GOSUB 1200
80 GOTO 30
90 TEXT : HOME : END
95 REM
96 REM *****
97 REM VARIABLE INITIALIZATION
98 REM *****
99 REM
100 DIM D(40,4),ND(40,4),T$(3)
130 FOR I = 0 TO 40
135 FOR J = 0 TO 4
140 D(I,J) = 0:ND(I,J) = 0
150 NEXT J,I
170 RETURN
195 REM
196 REM *****
197 REM INVALID ENTRY RESPONSE
198 REM *****
199 REM
200 PRINT : PRINT "INVALID ENTRY. "
210 INPUT "PRESS <RETURN> TO CONTINUE...";X$
220 RETURN
1195 REM
1196 REM *****
1197 REM DATA ENTRY CORRECTION
1198 REM *****
1199 REM
1200 FOR J = 1 TO S
1210 FOR I = 1 TO N
1220 D(I,J) = D(I,J) + D(0,J)
1230 NEXT I
1240 NEXT J
1300 PRINT "-----"
1310 PRINT "DO YOU WISH TO CHANGE ANY DATA ENTRIES?"
1320 INPUT "(Y/N)...";X$
1330 IF X$ < > "Y" AND X$ < > "N" THEN GOSUB 200: GOTO 1300
1340 IF X$ = "N" THEN 1390
1345 PRINT : INPUT "WHICH DATA SET...";ES
1346 IF ES < 1 OR ES > S THEN 1345
1350 INPUT "WHICH ENTRY NUMBER...";EN
1351 IF EN < 0 OR EN > N THEN 1350
1360 PRINT "ENTRY "EN" IN SET "ES" IS "D(EN,ES)."
1370 INPUT "WHAT VALUE SHOULD IT HAVE? ";NV
1380 D(EN,ES) = NV: GOTO 1300
1390 RETURN
2995 REM
2996 REM *****
2997 REM GRAPH BORDER
2998 REM *****
2999 REM
3000 HGR
3005 POKE - 16301,0
3010 C0 = 3: HCOLOR= C0
3020 HPLOT 0,0 TO 279,0 TO 279,159 TO 0,159 TO 0,0
3060 RETURN
9995 REM
9996 REM *****
9997 REM GET NO. OF DATA SETS
9998 REM *****
9999 REM
10000 HOME : PRINT
10010 PRINT "*****"
10020 PRINT " LINE GRAPH GENERATOR"
10030 PRINT "*****"
10040 GOSUB 100: PRINT
10050 PRINT "HOW MANY SETS OF DATA (1-4) DO YOU"
10060 PRINT "WISH TO PLOT SIMULTANEOUSLY? ";
10070 INPUT " ";S
10080 IF S < 1 OR S > 4 THEN GOSUB 200: GOTO 10000
10090 PRINT : PRINT "HOW MANY DATA POINTS IN YOUR LARGEST"
10100 PRINT "SET (2-39. ENTER 0 TO END)...";
10110 INPUT " ";N
10120 IF N = 0 THEN RETURN

```

Listing continued.

Listing continued.

```

10130 IF N < 2 OR N > 39 THEN GOSUB 200: GOTO 10090
10140 PRINT
10150 FOR T = 1 TO 3
10160 PRINT "ENTER TEXT LINE #\"T\": \"
10170 INPUT \"\",T$(T)
10180 PRINT
10190 NEXT T
11995 REM
11996 REM *****
11997 REM DATA ELEMENT ENTRY
11998 REM *****
11999 REM
12000 PRINT
12010 PRINT
12020 FOR J = 1 TO S
12030 FOR I = 1 TO N
12040 PRINT \"DATA POINT #\"I\" FOR SET \"J\": \";
12050 INPUT \"\",D(I,J)
12060 NEXT I,J
12070 PRINT
12080 FOR J = 1 TO S
12090 PRINT \"WHAT COMMON VALUE (OR 0) IS TO BE SUB-\"
12100 PRINT \"TRACTED FROM EACH VALUE IN DATA SET \"J\": \";
12110 INPUT \"\",D(0,J)
12120 PRINT
12130 NEXT J
12140 PRINT \"THESE VALUES WILL BE STORED IN ELEMENT ZERO OF EACH SET.\"
12150 RETURN
12295 REM
12296 REM *****
12297 REM NORMALIZE DATA INTO ND
12298 REM *****
12299 REM
12300 FOR J = 1 TO S
12310 D(1,J) = D(1,J) - D(0,J)
12320 D(40,J) = D(1,J)
12330 NEXT J:HV = 0
12340 FOR J = 1 TO S
12350 FOR I = 2 TO N
12360 D(I,J) = D(I,J) - D(0,J)
12370 IF D(I,J) > D(40,J) THEN D(40,J) = D(I,J)
12380 NEXT I
12390 IF D(40,J) > HV THEN HV = D(40,J)
12400 NEXT J
12405 NF = 160 / HV
12410 FOR J = 1 TO S
12415 FOR I = 1 TO N
12420 ND(I,J) = INT (D(I,J) * NF)
12425 NEXT I,J
12450 MG = 10
12460 W = INT (259 / (N - 1))
12470 MG = INT ((279 - W * N) / 2)
12480 IF MG < 10 THEN MG = 10
12490 RETURN
12495 REM
12496 REM *****
12497 REM PLOTTER ROUTINE
12498 REM *****
12499 REM
12500 REM
12510 GOSUB 3000
12520 FOR J = 1 TO S
12530 P = MG
12540 IF C0 = 1 THEN C0 = 3: GOTO 12550
12545 C0 = 1
12550 FOR H = 1 TO N
12560 HCOLOR= C0
12570 HPLLOT P,160 - ND(H,J) TO P + W,160 - ND(H + 1,J)
12580 P = P + W
12585 IF H + 1 = N THEN H = N
12590 NEXT H,J
12600 P = MG
12610 FOR H = 1 TO N
12615 HCOLOR= 3
12620 FOR J = 1 TO 160 STEP 3
12630 HPLLOT P,J
12635 NEXT J
12640 P = P + W
12650 NEXT H
12700 HOME
12750 HTAB 1: VTAB 21
12760 PRINT T$(1)
12770 PRINT T$(2)
12780 PRINT T$(3)
12790 RETURN

```

End of listing.

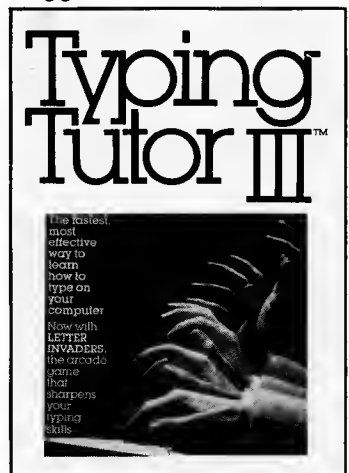
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BEGINNER'S PAGE

From time to time *inCider* will run Beginner's Page—step-by-step instructions to help novice Apple users type in and enjoy the programs *inCider* publishes.

The instructions assume that you have an Apple II, II Plus, IIe, or IIc computer with one disk drive and either DOS 3.3 or ProDOS. You also need one blank, 5¼-inch disk. If you're using the UniDisk 3.5, you will be restricted to ProDOS and, of course, you will need a blank 3.5 inch disk. To type in and run *inCider's* programs, just follow the instructions.

Creating a BASIC Programs Disk

The first step is to prepare a disk on which to save your programs. This process is called *formatting*. In addition, ProDOS requires you to copy two files, PRODOS and BASIC.SYSTEM, to create a start-up disk. For details about creating a DOS 3.3 disk, see the *DOS Programmer's Manual*. You will find information about creating a ProDOS start-up disk in *BASIC Programming with ProDOS* or the *System Utilities Manual*.

Typing In BASIC Programs

- When you find a program you'd like to type in, put your programs disk into drive 1 (the internal drive on the IIc) and turn on your computer. After the disk stops, the Applesoft BASIC prompt "J" appears on the screen. At this point, type in HOME and hit the return key to move the prompt to the upper-left corner of the screen. Next, enter NEW and press the return key.

- Having cleared memory with the NEW command, you are now ready to enter the first line of the BASIC program. First, type in the line number (most BASIC programs begin with

line 10), and then type the rest of the line exactly as it appears in the magazine. Don't worry if the line is longer than the width of your screen display. The program line will automatically jump to the next line on your screen. Once you have entered the entire program line, hit the return key.

- Continue to enter program lines in this manner until the entire program is in memory. Now, even before you run the program, save it to disk so that all of your work won't accidentally be lost. The SAVE command copies a program from main memory (RAM) to disk. Just type SAVE *file name* (where file name is the name of the program) and press the return key.

- Since the program is still in memory, you can run it with the RUN command. Unless you are a very careful typist, you now face the task of removing syntax errors from the program. For example, if, when you run the program, you get a message saying SYNTAX ERROR IN 1050, it's a good bet that you made a typing error in line 1050. The simplest way to correct it is to retype the entire line. The computer will automatically delete the old line and replace it with the new one.

- When you have the program running properly, save the corrected version by typing SAVE *file name* again. This command overwrites the old version of the program with the corrected version.

Typing In Machine-Language Programs and Shape Tables

Many programs in *inCider* use machine-language routines and shape tables. The listings for machine code consist of hexadecimal RAM addresses followed by the hex code (5E00- A9 04 30 65 FA 8C 1B 09, for example). To type in such a listing, follow the guidelines below:

- Turn on your computer with your programs disk in drive 1.

- From the Applesoft prompt, type in CALL - 151 (the dash is a minus sign) and hit the return key.

- An asterisk, the Monitor prompt, now replaces the Applesoft prompt.

- At this point, get the first address of the machine-language program from the listing. This address is the first four characters in the listing.

- Type in this address, followed by a colon (*not* a minus sign!). Now type in the hex numbers as they appear in the magazine. For example, if the hex line shown above were the first line of a hex program, you would enter:

5E00: A9 04 30 65 FA 8C 1B 09

and then hit the return key.

- For subsequent lines in the machine-language listing, you don't have to type in the address. Just type in a colon at the start of each line and then the hex bytes, followed by a return-key press.

- To check your typing before you save the listing, type in the starting address of the program and hit the return key. The number that appears is the content of the byte at the address shown. Hitting it again produces the rest of the first program line on the screen. Pressing the return key subsequent times makes additional program lines appear for your inspection. If any line requires changing, just retype that line, being sure to include the address and to use a colon in place of the minus sign.

- Once the entire listing is correct, you have to save it. First, type in 3DOG and hit the return key to return to the Applesoft prompt.

- Now type BSAVE *file name*, Aa, L/ (where a is the starting address of the routine and L is the length). If these are hexadecimal instead of decimal values, a \$ will precede them. Don't worry about having to figure out the address and length parameters yourself; these are always published with the program.

You now know what it takes to type in and use the programs published by *inCider*. ■

RIGHT OF ASSEMBLY

Assembly-Language Comparisons: Reading the Keyboard

by Roger Wagner

In the last installment of Right of Assembly ("Branching Out," April 1986, p. 87), I showed you how to use testing instructions like BEQ and BNE to create simple loops. You use the X- and Y-registers as counters, and increment or decrement by one for each cycle of the loop.

Now let's expand our repertoire of instructions by adding some new ones, and in the process add some flexibility to what you can do with loops and tests in general.

The Carry Flag

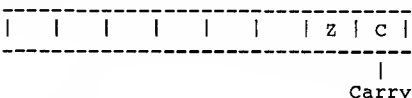
The programs in my last column wait for the counters to reach zero, then test via the Z-flag before taking appropriate action. Suppose, though, you'd like to test for a value other than zero. You can do this with the compare instruction and carry flag.

The mnemonic for the compare instruction is CMP #*\$A0*, which you can read, "Compare accumulator with an immediate *\$A0*." This tells the 6502 to compare the accumulator with the specific value *\$A0*. On the other hand, you may want to compare the accumulator with the content of a given memory location, indicated by CMP *\$A0*.

In this case, the 6502 checks the content of location *\$A0* and compares it to the accumulator. It's important to understand that the content of *\$A0* can be anything from *\$00* to *\$FF*, and that the accumulator is compared against this value. In each case, the computer performs the comparison by subtracting the value in the accumulator from the specified value (the result, though, is invisible to you).

The 6502 uses the carry flag to determine the result of the comparison. Right next to the Z-flag in the status register is the bit called the CARRY (see the **Figure**), which the 6502

Figure. The CARRY bit in the status register.



More on using loops to test for values and ranges.

uses during addition and subtraction.

Since the compare operation involves subtraction, the carry flag can test the result with two new branch instructions, BCC and BCS. BCC (Branch Carry Clear) branches appropriately if the accumulator is less than the value against which it's compared. BCS stands for Branch Carry Set, and is taken when the accumulator is equal to or greater than the value used.

Testing for Ranges

Now you can test for ranges, as well as specific values. Try the example shown in **Listing 1**.

Let's step through the program. After the JSR to the clear-screen routine, you load X with zero in preparation for reading a paddle. The *#00* tells the routine to read paddle zero, and the answer is returned in the Y-register, which you then transfer to the accumulator with a TYA. At this point you use the "filter."

If the accumulator is less than the ASCII value for the letter A, you can avoid the printout by going back to LOOP. I've added *\$80* to the ASCII value for A to get normal output on screen. If you test for *\$41* instead, flashing characters will appear on screen.

You want the BCS to catch all values higher than the ASCII value for Z, so you must compare the accumulator with the ASCII value for the character after Z. You can use an ASCII-character chart (see the accom-

Listing 1. Testing for ranges in assembly-language paddle program.

| | | | |
|----------------|----|------------------------|--------------------------------------|
| | 1 | ***** | |
| | 2 | * PADDLE PROGRAM #2A * | |
| | 3 | * 6/1/86 * | |
| | 4 | * MERLIN ASSEMBLER * | |
| | 5 | ***** | |
| | 6 | * | |
| | 7 | ORG \$300 | |
| | 8 | * | |
| | 9 | PREAD EQU \$FB1E | |
| | 10 | HOME EQU \$FC58 | |
| | 11 | COUT EQU \$FDED | |
| | 12 | * | |
| 0300: 20 58 FC | 13 | START JSR HOME | ; CLEAR SCREEN |
| 0303: A2 00 | 14 | LDX #00 | ; PADDLE = #0 |
| 0305: 20 1E FB | 15 | LOOP JSR PREAD | ; READ PADDLE |
| 0308: 98 | 16 | TYA | ; PUT VALUE IN ACC. |
| 0309: C1 C1 | 17 | CMP #\$C1 | ; CMP TO ASCII VALUE FOR "A" |
| 030B: 90 F8 | 18 | BCC LOOP | ; TRY AGAIN IF LESS THAN |
| 030D: C9 DB | 19 | CMP #\$DB | ; CMP TO ASCII VALUE FOR "[" ("Z"+1) |
| 030F: B0 F4 | 20 | BCS LOOP | ; TRY AGAIN IF EQU OR GREATER |
| 0311: 20 ED FD | 21 | JSR COUT | ; PRINT ASCII CHARACTER |
| 0314: 4C 05 03 | 22 | JMP LOOP | ; DO IT AGAIN |
| | 23 | * INFINITE LOOP | |

Table 1. ASCII character chart.

| DEC | HEX | CHR | DEC | HEX | CHR | DEC | HEX | CHR | DEC | HEX | CHR | DEC | HEX | CHR | DEC | HEX | CHR |
|-----|-----|-----|-----|-----|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|
| 0 | 0 | ^@ | 22 | 16 | ^V | 43 | 2B | + | 65 | 41 | A | 85 | 55 | U | 107 | 6B | k |
| 1 | 1 | ^A | 23 | 17 | ^W | 44 | 2C | , | 66 | 42 | B | 86 | 56 | V | 108 | 6C | l |
| 2 | 2 | ^B | 24 | 18 | ^X | 45 | 2D | - | 67 | 43 | C | 87 | 57 | W | 109 | 6D | m |
| 3 | 3 | ^C | 25 | 19 | ^Y | 46 | 2E | . | 68 | 44 | D | 88 | 58 | X | 110 | 6E | n |
| 4 | 4 | ^D | 26 | 1A | ^Z | 47 | 2F | / | 69 | 45 | E | 89 | 59 | Y | 111 | 6F | o |
| 5 | 5 | ^E | 27 | 1B | Esc | 48 | 30 | 0 | 70 | 46 | F | 90 | 5A | Z | 112 | 70 | p |
| 6 | 6 | ^F | 28 | 1C | ^\ ^] | 49 | 31 | 1 | 71 | 47 | G | 91 | 5B | [| 113 | 71 | q |
| 7 | 7 | ^G | 29 | 1D | ^] ^_ | 50 | 32 | 2 | 72 | 48 | H | 92 | 5C | \ | 114 | 72 | r |
| 8 | 8 | ^H | 30 | 1E | ^_ ^` | 51 | 33 | 3 | 73 | 49 | I | 93 | 5D |] | 115 | 73 | s |
| 9 | 9 | ^I | 31 | 1F | ^` ^~ | 52 | 34 | 4 | 74 | 4A | J | 94 | 5E | ^ | 116 | 74 | t |
| 10 | A | ^J | 32 | 20 | SpC | 53 | 35 | 5 | 75 | 4B | K | 95 | 5F | ~ | 117 | 75 | u |
| 11 | B | ^K | 33 | 21 | ! | 54 | 36 | 6 | 76 | 4C | L | 96 | 60 | ^ | 118 | 76 | v |
| 12 | C | ^L | 34 | 22 | " | 55 | 37 | 7 | 77 | 4D | M | 97 | 61 | a | 119 | 77 | w |
| 13 | D | ^M | 35 | 23 | # | 56 | 38 | 8 | 78 | 4E | N | 98 | 62 | b | 120 | 78 | x |
| 14 | E | ^N | 36 | 24 | \$ | 57 | 39 | 9 | 79 | 4F | O | 99 | 63 | c | 121 | 79 | y |
| 15 | F | ^O | 37 | 25 | % | 58 | 3A | : | 80 | 50 | P | 100 | 64 | d | 122 | 7A | z |
| 16 | 10 | ^P | 38 | 26 | & | 59 | 3B | ; | 81 | 51 | Q | 101 | 65 | e | 123 | 7B | { |
| 17 | 11 | ^Q | 39 | 27 | ' | 60 | 3C | < | 82 | 52 | R | 102 | 66 | f | 124 | 7C | |
| 18 | 12 | ^R | 40 | 28 | (| 61 | 3D | = | 83 | 53 | S | 103 | 67 | g | 125 | 7D | } |
| 19 | 13 | ^S | 41 | 29 |) | 62 | 3E | > | 84 | 54 | T | 104 | 68 | h | 126 | 7E | ` |
| 20 | 14 | ^T | 42 | 2A | * | 63 | 3F | ? | | | | 105 | 69 | i | 127 | 7F | Rub out |
| 21 | 15 | ^U | | | | 64 | 40 | @ | | | | 106 | 6A | j | | | |

^A = control-A, and so on

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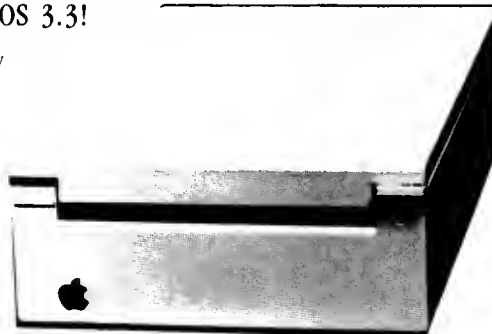
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panying sidebar and **Table 1**) to see where these numbers come from. Only numbers from \$C1 to \$DA can be printed using COUT (\$FDED).

Since the loop is infinite, RESET is required to exit.

The X- and Y-registers can be compared in a similar manner by the codes CPX and CPY. Try to rewrite

Listing 1 to use CPY instead of CMP.

BEQ and BNE are also still usable after a compare operation. See the summary in **Table 2**.

Keyboard Memory

As you've probably noticed, I enjoy using the paddles as input devices. They're an easy way to send values \$00-\$FF into the system in a smooth, natural way. You can get similar data from the keyboard, though: The advantage is that you can jump from one value to another with no transition.

Large parts of many formal machine-language courses deal only with system I/O—getting data in and out via different devices. Writing printer drivers, disk- or tape-access routines,

The ASCII System

ASCII (American Standard Code for Information Interchange) is a coding scheme for transmitting text. The Apple also uses it for encoding text in memory, for screen display, disk files, printer output, and many other areas. **Table 1** lists text characters and their ASCII values. One important note: It's possible to encode alphabetic characters (upper- and lowercase), numerics, special symbols, and control codes with only 128 number values. This means that ASCII is considered a 7-bit code.

All the information required to determine the character that's been sent is contained in bits zero through 6 of the byte. Thus, \$8A is reasonably equivalent to \$0A as far as its ASCII interpretation is concerned. The matter of the high bit (bit 7) being set or clear, though, can create considerable confusion when you don't know what the computer or output device expects.

Generally, the Apple operates internally with the high bit set on all characters. That is, characters retrieved from the keyboard via \$C000, and characters stored in the screen area of memory (\$400 to \$7F8) and on disk, usually have the high bit set (values greater than \$80). This is also the way Applesoft stores data within program lines. (To keep you on your toes, though, strings within a program, such as A\$ = "CAT", have the high bit clear.) When using COUT (the Monitor output routine), the high bit should be set (load the accumulator with values greater than \$80) before calling COUT. □

—R.W.

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Table 2. Reading data from the keyboard.

| Command | Action |
|---------|------------------------------------|
| CMP | Compares accumulator |
| CPX | Compares X-register |
| CPY | Compares Y-register |
| BCC | Branch if register < given value |
| BEQ | Branch if register = given value |
| BNE | Branch if register <> given value |
| BCS | Branch if register > = given value |

hardware-interface software, and so on, are areas hard-core programmers spend their youth trying to master. Using the Monitor routines on the Apple greatly simplifies this, because you don't have to write a lot of I/O details. You've already shown this by using the paddles (\$FB1E) for input and the screen (\$FDED) for output, without having to know how the actual operation works. The keyboard is even easier.

In the Apple's memory map, the address range \$C000-\$FFFF is devoted to hardware, in that running programs can't alter this memory range. (I'm ignoring RAM cards for the time being.) The ROM routines you've been calling use the range \$D0-\$FFFF. The range \$C000-\$CFFF is assigned to I/O devices. Typically, the second digit from the left gives you the slot number of the device. For instance, if your printer is connected to a card in slot 1, a look at \$C100 will reveal the machine-language code in the card's ROM. At \$C600 you'll probably find the code that makes the disk drive in slot 6 boot.

The range \$C000-\$C0FF is reserved not for slot zero, but for doing special things with the hardware portions of the Apple itself. An attempt to disassemble from \$C000 won't produce a recognizable listing, but will probably make your Apple act a bit oddly. This range represents a number of memory locations actually wired to physical parts of your Apple.

If you type \$C030 <RETURN> from the Monitor, the speaker should click, in addition to the monitor displaying some random value. Each time you access \$C030, the speaker will click in response.

The keyboard is also tied into a specific location. You can tell if a key has been pressed by looking at the content of \$C000. In BASIC, it's done with a PEEK (-16384). In machine language, you would load a register with the content of \$C000, such as LDA \$C000.

Because it's difficult to read the keyboard at exactly the instant someone presses a key, the keyboard holds the last key pressed until another key is pressed or you clear the *strobe*, as it's called, by accessing an alternate memory location, \$C010. The strobe is wired to clear any stray characters from the keyboard. When you check for a character, you don't want to pick up one you inadvertently entered before your inquiry.

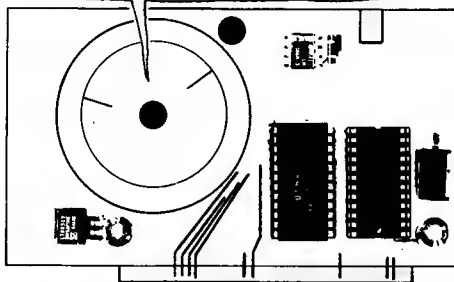
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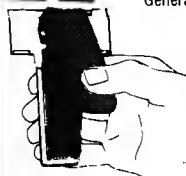
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RIGHT OF ASSEMBLY

It's a good idea to clear the keyboard when you're done with it; otherwise, the value for the last key pressed may interfere with whatever reads the keyboard next, such as a BASIC INPUT statement. Clear the strobe with either a read or a write operation—merely accessing the strobe in any manner will clear it.

Thus, LDA \$C010 will work just as well as STA \$C010.

The last point to remember is that the keyboard will tell you when a key is pressed by the value it reads at \$C000. You might think the logical way would be to keep a zero in \$C000. Instead, you add \$80 to the

Listing 2. Reading data from the keyboard without clearing the strobe.

```

1 *****
2 *          KEYBOARD PROGRAM #1A          *
3 *                      6/1/86              *
4 *          MERLIN ASSEMBLER              *
5 *****
6 *
7 *          ORG      $300
8 *
9 KYBD      EQU      $FB1E
10 STROBE    EQU      $C010
11 COUT      EQU      $FDED
12 HOME     EQU      $FC58
13 *
14 START     JSR      HOME      ; CLEAR SCREEN
15 LOOP      LDA      KYBD      ; READ
                                   KEYBOARD
0306: C9 80          16          CMP      #$80      ; KEY PRESSED?
0308: 9          BCC      LOOP      ; TRY AGAIN IF
                                   NOT...
030A: 20 ED FD 18          JSR      COUT      ; PRINT ASCII
                                   CHARACTER
030D: 4C 03 03 19          JMP      LOOP      ; DO IT AGAIN
20 * INFINITE LOOP
    
```

Listing 3. Clearing the strobe after each keypress.

```

1 *****
2 *          KEYBOARD PROGRAM #1B          *
3 *                      6/1/86              *
4 *          MERLIN ASSEMBLER              *
5 *****
6 *
7 *          ORG      $300
8 *
9 KYBD      EQU      $FB1E
10 STROBE    EQU      $C010
11 COUT      EQU      $FDED
12 HOME     EQU      $FC58
13 *
14 START     JSR      HOME      ; CLEAR SCREEN
15 LOOP      LDA      KYBD      ; READ
                                   KEYBOARD
0306: C9 80          16          CMP      #$80      ; KEY PRESSED?
0308: 90 F9          17          BCC      LOOP      ; TRY AGAIN IF
                                   NOT...
030A: 8D 10 C0 18          STA      STROBE      ; CLEAR
                                   CHARACTER
                                   FROM KYBD
030D: 20 ED FD 19          JSR      COUT      ; PRINT ASCII
                                   CHARACTER
0310: 4C 03 03 20          JMP      LOOP      ; DO IT AGAIN
21 * INFINITE LOOP
    
```

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ASCII value of the key you press. If a value less than \$80 is at \$C000, then a key hasn't been pressed.

Reading Keyboard Data

To illustrate all this, let's look at some sample programs that read data from the keyboard. In **Listing 2**, notice that the program continually prints the same character until you press another key. That's because you never cleared that "strobe" you thought I was just rambling on about. Once you press a key, it isn't cleared until you press another key.

Listing 3 should work better. Here, the keyboard clears whenever you get a character and print it. Why not clear it right after the read in line 15? If you did, you'd barely see the character at \$C000 just as you pressed the key. In this case you can probably do it because of the loop's speed. If you go to another routine for a while, though, or otherwise delay getting back to the LDA \$C000, you'll probably miss it.

Try typing in enough characters to wrap around to the next line, and also try the arrow and return keys. You may think all this performs as expected (except for the missing cursor), but you shouldn't take it for granted. Without COUT's screen management, you'd have to do quite a bit more programming to keep things straight. Once more, this is the advantage of using the routine present in the Monitor, rather than worrying about the details yourself.

Also notice how STA \$C010 is used to access the strobe. The important part is that you somehow access the strobe location, not how you do it. You should choose STA because you don't want to lose the content of the accumulator in doing the access.

Examine your Apple reference manuals for listings of the "soft switches" and other goodies at \$C000-\$C0FF; your Apple uses them to communicate with the outside world. And don't forget about all the routines present in the Monitor and Applesoft itself, as I mentioned in previous installments of this column. They're fun to experiment with just to test your wings. ■

Roger Wagner is the author of Assembly Lines: the Book and is president of Roger Wagner Publishing, the publisher of Merlin and MerlinPro assemblers. Write to him at Roger Wagner Publishing, 10761 Woodside Avenue, Suite E, P.O. Box 582, San-tee, CA 92071.

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REVIEWS

Continued from p. 41.

four arithmetic skills. Get the right answer and your horse moves ahead (two speeds, ten levels)—good for the kids.

Technical Troubles

I encountered a problem when I attempted to print mailing labels (from Address Book) on my ImageWriter. I called the manufacturer and was told (politely, I must admit) I probably didn't know what I was doing. A technical person called back and, after running through the steps with me (still without success), promised a replacement disk. Then came the third call. I wouldn't be getting another disk, said the public-relations representative, because "the problem seems to be with your printer, not our program." I'd have to change one of the DIP-switch settings, she said.

The payoff came when she said that no one was available at that time to tell me which DIP switch I had to change. If reviewers, whom software manufacturers generally coddle, get such sleazy treatment, what can other customers expect? ■

Wayne J. Sassano
Wethersfield, CT



A Hybrid Language

PROMAL

Systems Management Associates, 3700 Computer Drive, Raleigh, NC 27619

Programming language; any Apple IIc or 128K IIe, extended 80-column card \$49.95 (versions 1.0 and 2.0), \$99.95 (developer's version)

| | |
|---------------|---------|
| Ease of setup | ■ ■ ■ ■ |
| Ease of use | ■ ■ |
| Documentation | ■ ■ |
| Support | ■ ■ ■ ■ |
| Overall | ■ ■ ■ |

PROMAL (Programmer's Micro Applications Language) is the first major

effort by Systems Management Associates to enter the under-\$100 compiled-language market. Although it didn't receive much attention when it was introduced, PROMAL has several useful features that may make it a good system for beginning programmers looking for the speed of a compiled language and the interaction of a language like BASIC.

PROMAL is a unique cross between Pascal and C, with a little UNIX input/output-redirection capability thrown in for good measure. Like Pascal and C, PROMAL is a structured language.

Decision and repetitive-execution constructs include IF...THEN, FOR...NEXT, CHOOSE (similar to GOTO/GOSUB in BASIC and CASE in Pascal and C), WHILE, and REPEAT. Data entry isn't as versatile as it is in Pascal and C, though.

PROMAL supports only the data types BYTE, WORD, INT (integer), and REAL as constants (CON). It doesn't offer DATA enumerations (constants or arrays of BYTE, WORD, INT, or REAL data objects), or exotic data structures such as Pascal's RECORD and C's STRUCT.

The language supplies an extensive library of predefined procedures and functions. You can include these useful "subroutines" in your own programs to handle string functions, random and sequential file access, and formatted numeric output. The newest version of PROMAL (2.0) also offers a multidimensional-array language extension and library support of program overlays. A \$30 graphics and windowing library extension is also available.

Because the PROMAL environment is ProDOS, you also get a feature called the Executive, which lets you copy, rename, display, or print disk and file contents, manage any one of eight programs in memory, or do simple debugging. As with UNIX, you can also direct a program's input or output to and from another file, or run batch files (EXEC files in Applesoft).

Strict Syntax

During my six-month review of PROMAL (versions 1.0 and 2.0), I never got used to its forced structure. Unlike BASIC, Pascal, C, and most other languages, PROMAL programs must follow a very strict indented syntax. You must indent all statement sequences within PROMAL constructs and loops at least two spaces.

This can become quite annoying if you're used to another language. I always found myself wishing PROMAL required the END keyword as a construct or loop terminator. The full-screen, cursor-driven editor is functional and offers edit-after-error and on-line help features. I hated hitting the awkward control-I and control-W keystroke sequences to manipulate indentation.

Systems Management Associates claims that the PROMAL p-code compiler can compile a 100-line program in less than ten seconds. But you can run the p-code programs only from within PROMAL, so you can't create stand-alone program disks unless you purchase the \$100 developer's version of PROMAL.

The manual is very well written and organized, but it isn't an effective tutorial for the PROMAL language. The documentation and sample programs on the system disk are an attempt to simplify the learning process, but I don't think a BASIC programmer could jump into this manual and come out with enough knowledge to write anything more than very simple programs. And as far as I know, no learning materials or books are available to supplement the documentation.

Because of the limited programming capabilities of PROMAL and the total lack of third-party support, I'd have to restrict my recommendation of PROMAL. BASIC programmers who want an inexpensive compiled language for simple applications and aren't worried about outgrowing its capabilities may find PROMAL adequate. Otherwise, I'd recommend an established language like Pascal for more elaborate, unrestricted programming endeavors. ■

David W. Hoover
Sacramento, CA

Editor's note: John Segner of Systems Management Associates reports that PROMAL Graphics Toolbox Version 1.0 is now available. The package costs \$29.95 (plus \$2.50 for shipping and handling) and works only with PROMAL Version 2.0.

In the Market

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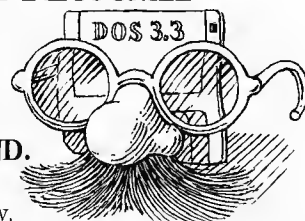
Program Operation

The setup procedures for configuring your modem, including DIP switches and serial cards, are included in the manuals for Apple, Hayes, Novation, and SSM modems. If you set up the working disks on a two-drive system, you can never use them with one drive. As you can make only two copies of the program, you may want to save one in case you ever need the program and your second drive dies. The utilities disk that comes with the program isn't copy-protected.

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standard open-apple/number-key interface. The main modules handle communication, portfolio maintenance, reports, pricing, utilities, and setup.

The communications module presents no problem. The program prompts you for information, and establishes an automatic log-on through DowNet, TeleNet, TymNet, or UniNet, using a local access number. The software includes defaults for all but the password, and you can change them at each prompt with a Lotus-style menu.

Another system-configuration menu lets you establish the printer's character pitch, your definition of long-term gain (unless you'd like to accept the normal six-month default), any numerical rounding you want, and whether the software should sort reports by symbol or type. You can quickly make any subsequent changes by reentering this menu and correcting the information.

The entire set-up procedure takes less than 15 minutes. Once you get used to moving around in the data

base, obtaining price quotes and financial news on line is simple.

Establishing your own portfolio files is also screen-prompted. Once you type in buys, the program automatically matches sells. You can also log on and get automatic up-to-date pricing on the contents of any portfolio. The program flags any item above or below the price range you set. It also lets you maintain the tax classification of your holdings and any dividends or interest on them. Reports default to output on all portfolios the system maintains, but you can select individual portfolios.

Error trapping within Market Manager Plus is good. The program refuses to accept erroneous information, and warns you if a particular action could endanger your data.

User Support

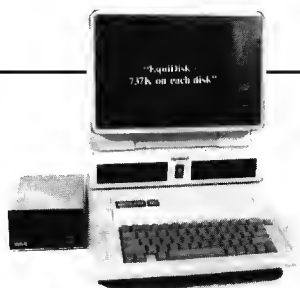
The Market Manager Plus manual is concise and straightforward. It's not an introduction to investing. It does explain certain error messages the program may produce, along with

possible recovery procedures, and it includes an index. The Dow Jones people also provide toll-free support, with courteous, accurate answers to your questions.

Market Manager Plus carries a 60-day warranty with free replacement of disks. After that, there's a charge of \$30. The program also puts you on line with the News/Retrieval Service free (normally a \$75 charge with other portfolio programs) and provides one hour of free access time (to be used within 30 days of registration). As for subsequent costs, you must pay a \$3 access fee each time (or \$12 annually), plus the rates for your on-line time (20 to 90 cents per minute). There's an additional charge for 1200- or 2400-baud connections.

Dow Jones Market Manager Plus is a professional package that should accomplish most of what you'd need from a portfolio manager, and it's easy to use. At \$249, it's expensive, but you can write it off on your taxes, right? ■

*Douglas Landin-Young
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Most games claiming to be educational fail to deliver on their promises. They provide instead either unsound teaching based on a dazzling display of programming skill, or adequate teaching in poorly planned, bug-filled programs. *Equations Challenge Matches* is one of the rare exceptions. It's well written, and it can effectively teach mathematics.

In this computer variation of the board game of the same name, matches take place between the student and the computer, or between two players. The game randomly selects numbers and mathematical operations, and from these "resources", chooses a goal. You meet this goal by using resources no more than once each, along with parentheses, to form an equation.

On each turn, a player limits the possible equations by moving one of the resources to "permitted," "required," or "forbidden" status. The game ends when no legal move remains (a force-out), or when one player makes an error (flub) and is challenged successfully.

There are three types of errors: A P-flub prevents you from forming any valid equations; an A-flub unnecessarily lets you form a solution that uses exactly one of the resources; and a C-flub is a failure to challenge a previous flub.

The player who suggests a solution, whether as part of a challenge or in

the face of one, must prove it by producing the equation. If it's correct, the player wins and receives ten points.

A Tool for Math Teachers

The *Equations* package contains three disk sides on two floppies. The *Diagnostics Instructional Gaming (DIG)* program is a series of "set" matches, played between you and "Mate" (the computer). Mate moves in ways that let you win, occasionally making a flub, but always challenging a student's flub.

The *Introduction to Equations* tutorial program explains all the rules through actual game situations, showing the last move, and asking for the next appropriate move. Although there are a few errors in spelling and punctuation in this section, it's better than average on the whole. This is helpful, because the accompanying manual is too brief to be of much use.

The *Equations Challenge Matches* disk sets up a series of contests with resources already chosen. Here, a two-player game is established, with the

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A/D SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- Fast conversion (.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, -5 to +5, -2.5 to +2.5, -5 to 0, -10 to 0.

The A/D process takes place on a continuous, channel sequencing basis. Data is automatically transferred to its proper location in the on-board RAM. No A/D converter could be easier to use.

D/A SPECIFICATIONS

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- On-board memory
- On-board output buffer amps can drive 5 MA
- D/A process is totally transparent to the Apple (just poke the data)
- Fast conversion (.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

The D/A section contains 8 digital to analog converters, with output buffer amplifiers and all interface logic on a single card. On-card latches are provided for each of the eight D/A converters. No D/A converter could be easier to use. The on-board amplifiers are laser-trimmed during manufacture, thereby eliminating any requirement for off-set nulling.

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REVIEWS

computer acting as game board, referee, and prompter. For instance, if you can't sustain a P-flub challenge when a solution exists, the computer might say, "You could have used $12 = 9/3/4$."

You can use equations to teach mathematical concepts at several levels. The preview disks I reviewed contained a wide sampling of material, from simple addition and subtraction to polynomial factoring and logarithms.

No Pizzazz

Quality teaching and programming are evident here. None of the programs crashed, errors are well trapped, and the assistance the program provides is actually helpful.

There are some negative points, though. These materials are definitely outside the mainstream of computer gaming—there's no attempt to spruce things up with good graphics, the package keeps no running score or record of high scores, and the program includes no sound effects—in short, it lacks pizzazz. That will reduce Equations' appeal for students.

The program replies to wrong answers with a blunt "incorrect"—the developer should have used a gentler approach. And there's no warning that the preview disk won't boot if it's write-protected.

Equations poorly handles two mathematical concepts. It uses \times for multiplication, which is satisfactory, but it uses an asterisk (which most systems use to indicate multiplication) rather than a caret for exponential notation. This is likely to be confusing for students who are familiar with programming. In addition, the notation A/B is explained as "the logarithm of B to the base of A." Both the poor wording and the choice of symbols are guaranteed to confuse you.

The P-system lurking behind the program is also evident. Things move along slowly through innumerable disk accesses, especially in the tutorial material, where the drive turns on every few seconds.

I rather like Equations, and may buy some of the disks for my children. For schools, the publisher offers a site license for the DIG math program, at a cost of \$100 per machine. (Single-item purchase of the entire set would be unreasonably expensive.) The bottom line is that Equations gets a somewhat qualified nod of approval. ■

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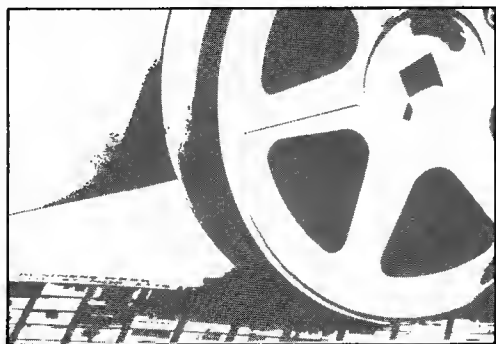
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by Brian J. Murphy

In Game Room, Brian Murphy tells us what's new in the world of Apple games. Look here for inCider's scoop on the latest fun.

inCider's Ratings

- ★★★★ Excellent
- ★★★ Above average
- ★★ Good enough
- ★ Not up to standards
- ☆ The empty set

AutoDuel

★★★★

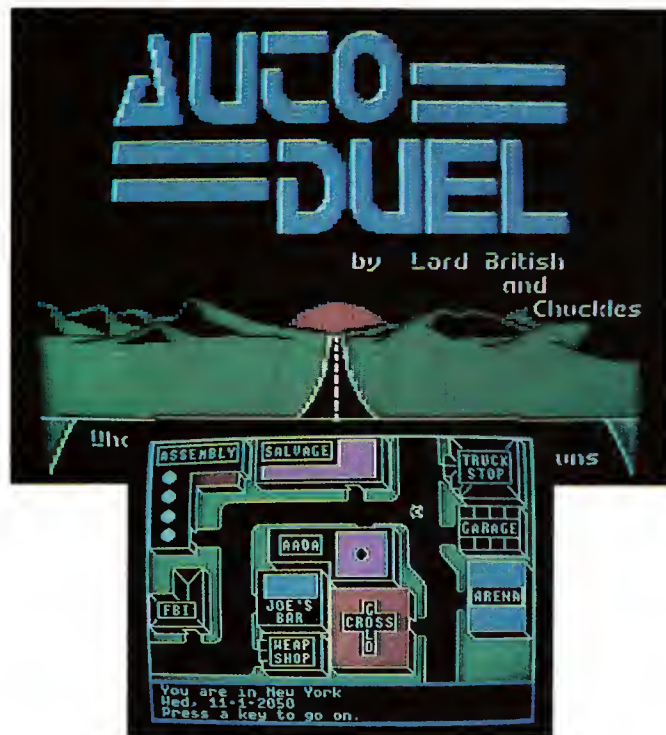
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The most original concept for a fantasy/role-playing game in years forms the basis of **AutoDuel**, by Lord British and Chuckles. If the Ultima games were adapted for a Mad Max movie, the result would be AutoDuel.

There are no elves, gnomes, kobolds, or dragons in sight, just near-future bands of punks and outlaws on wheels, roaming the highways bent on murder for fun. You, of course, are a good guy, a courier for the American AutoDuel Association. Your car is heavily armored and bristles with such weapons as rockets, flamethrowers, and machine guns.

Your mission is to just survive. On the way you can accumulate cars, money, prestige, and fame, but the bottom line is survival. On the highways, you do battle in spectacular auto dogfights. In the cities,



You're on your own during AutoDuel.

you'll compete as a motorized gladiator in the arena, frequent the hangouts of other road warriors, and repair your combat car. You'll also pick up shipments of goods you must deliver to remote towns via the deadly highways.

There are 16 cities in eight Northeastern states to explore. The experience of travel between towns can be very quiet or very nerve-wracking as swarms of speeding bandits do their best to waste you—nothing personal, of course, it's just for fun.

AutoDuel deserves a lot more ink than I can give it here. It's refreshing to play a fantasy game that isn't set in an age of legend, swords, and sorcery. AutoDuel offers a gaming challenge only marginally less difficult than that of the Ultima series, and the supporting manuals and docu-

mentation are fabulous. They explain the game clearly, and add substantially to the realism.

The world you have to explore is much smaller than the four Ultima games, but in every other way, Chuckles has constructed a game as challenging and exciting as the swords 'n' sorcery series. AutoDuel is an absolute must if you're a real game connoisseur—or if you just crave action and excitement.

The Bard's Tale

★★★★

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True game addiction is when you let everything

slide—your spouse, your kids, your career, meals, sleep, bathing, *The Cosby Show*, everything—just to clear time to sit at your computer and play a game.

The Bard's Tale is for true game addicts. In the words of one fantasy-game freak I know, "It's like Wizardry, only more so!"

Michael Crawford, whose credits include *Super Zaxxon* and the Apple version of *Donkey Kong*, has taken what amounts to the Wizardry playing system, set the action in a maze-like city, and added full-color graphics.

For those of you not familiar with Wizardry's game system, much less that of *The Bard's Tale*, let's briefly review the setup as Crawford has adapted it.

As in most fantasy/role-playing games, you find yourself controlling a band of adventurers seeking to free a city (Skara Brae—a name you'll recognize from the Ultima series) from bondage to an evil sorcerer. To do this, you'll have to find various magic items cleverly hidden in the labyrinthine depths of Skara Brae. You must explore the streets and houses, and search the temples, towers, and castles above and the cellars, dungeons, and catacombs below. Believe me, just finding your way in and out of these places will require some nimble mental gymnastics.

Monsters of every description, evil humans, and malignant, undead spirits will set upon your brave party at almost every turn from the moment you set foot out of the Adventurers' Guild, so be prepared. Your party of six seekers should include at least three fighters, two magic

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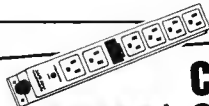
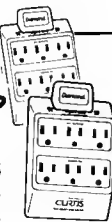
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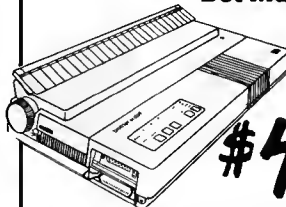
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GAME ROOM



Explore a world of magic and mystery in *The Bard's Tale*.

users, and a utility member, such as a thief (who can easily open booby-trapped treasure chests) or a bard (whose songs have a magical effect in combat).

Wizardry alumni will find this game rather familiar. The big differences between *Wiz* and *The Bard's Tale* are refinements in the system and atmosphere of the game. *The Bard's Tale* uses color graphics far more extensively than the *Wizardry* games do, and color makes a big difference when you're exploring mazes and dungeons. Instead of boring white outlines on a black screen (à la *Wizardry*), dungeons and castle mazes look like realistic rock labyrinths. The doors to secret chambers are finely drawn to realistically depict heavy oak beams and wrought-iron hinges and handles. This attention to detail makes the experience convincing.

Exciting Graphics

Have you noticed how claustrophobic *Wizardry* games are? That's because the only graphics in the game are found in the dungeons' mazes. In *The Bard's Tale*, there's a three-dimensional world to explore outside the dungeons and castles. You wander down streets and lanes lined with quaint houses, inns, shops, and temples, and meet adventure along the way. There's even a day/night cycle for extra realism (some of the shops and services will be shut down after dark).

It's very hard to establish a set of characters (just as in any good fantasy-adventure game). Given the many large gangs of monsters wandering the streets, it's easy to inadvertently lose your whole party in the early going, forcing you to construct new adventurers.

Fortunately for experienced players, there's a way around this—you can use *Wizardry* or *Ultima III* characters in *The Bard's Tale*. With heavily armored, experienced fighters and powerful magic users, you can get right into the main action of *The Bard's Tale* without undergoing a boring apprenticeship. It's a boon for experienced fantasy-game players, who find the process of establishing characters more tedious than entertaining. (The borrowing utility does not alter the characters as they appear on your *Wizardry* or *Ultima III* character disks.)

The Bard's Tale may not win any points for originality, but it's a solid winner in graphics, excitement, atmosphere, challenge, and entertainment.

Now for the tips and hints. Drink wine when it's an option. Explore every white building in the city. Even if nobody's drinking, make sure your exhausted magic users go bar-hopping. If the lights go out in a dungeon, back out the way you came immediately—you've struck an anti-magic zone. And never enter a dungeon with less than full spell and hit points. They play rough in there. ■

Brian Murphy is anxious to learn what you think of the current state of computer games. Write him at inCider, 80 Pine Street, Peterborough, NH 03458, and let him know your opinion.

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STATUS REPORT



Flight of the Bumblebee

by Paul Statt, *inCider* staff

"Even if it means a little more work, you can make your Apple II do almost anything."

Bumblebees can't fly. That's one of the first things budding aerophysicists and entomologists learn. Extensive research has shown that given its body size, musculature, wing speed, intelligence, and basic outlook on life, the bumblebee is more or less confined to its hive.

Any bright day in June will prove you wrong. Bees buzz everywhere. In fact, we felt stung last year when we began organizing a review of 2400-baud modems for Bill O'Brien (May 1986, p. 70).

A widely known maker of modems—widely known the way Kleenex is a widely known brand of facial tissue—assured us that "our 2400-baud modem works with the Mac, but not the Apple II."

We might have gone on our way, resigned to a lack of 2400-baud modems for the II, sad that so few manufacturers support the most popular microcomputer in the world. But Bill persisted.

Bill's ears perked up when all the manufacturers said the same thing. "It won't work with the II," they insisted. "Send me the modem anyway," he told them all. "I'll decide if it communicates with my Apple II."

The rest, as they say, is history. All the modems worked with Bill's Apple II—some better than others, some not as well.

If this were an isolated pain in the neck, it might pass without comment. But we're attacked by swarms of products—especially peripherals—that "don't support the Apple II." IBM-compatible RGB monitors, Mac modems, the letter-quality Lisa printer your dealer swears won't print anything from your II: Do you envy other users the ads in *Byte*? It's the Apple II owner who feels the bite—until, as Bill O'Brien discovered, "you plug it in and try it."

The pains of hardware incompatibility can be salved. Flip a couple of DIP switches on the Mac ImageWriter, for instance, *et voilà*, it prints Apple II documents with ease. You like the nifty Apple Personal Modem, or some other peripheral with a six-pin serial DIN connector? Buy a BusinessCard from Street Electronics and you've got two DIN ports for your II/e—just like a II/c.

Those Princeton Graphic RGB monitors surely show beautiful colors—I hated to give up my HX-9 when the review ("Screen Tests," October 1985, p. 16) was done. It's indeed an IBM RGB monitor, but with a little help from a Video-7 RGB interface, you can make almost any monitor and computer friends.

This kind of retrofitting and jerryrigging is what makes the Apple II great: Even if it means a little more work, you can make your Apple II do almost anything. Beyond peripherals, remember that all kinds of operating systems and interfaces are available to you—it's as easy as sliding in a drawer.

You may need some bizarre, mysterious cables and converters to work this Apple alchemy. But, more importantly, you need imagination and vision—the kind of vision that shatters myths.

Your dealer doesn't perpetuate those myths alone. For instance, Apple Computer Inc. keeps the fact that the Mac's LaserWriter works with the II/e, too, pretty quiet. Next month in *inCider*, Bill O'Brien will offer a LaserWriter primer. What he may not mention is the trouble he had making anyone at Apple believe in his LaserWriter/Apple Writer project.

All you need to start is PostScript, the LaserWriter language from Adobe Systems. Author and software developer Don Lancaster, guru of many who wouldn't give up because it seemed impossible, claims that the LaserWriter prints faster and more cleanly with an Apple II and Apple Writer II than with the Macintosh. Call him at (602) 428-4073 and hear what he has to say.

The moral of the story of the flight of the bumblebee, dear reader, is don't give up. Don't assume that what Joe at the computer store tells you is gospel, don't accept the hardware manufacturer's bald assertion that "it won't work with the II," and don't even take Apple's word for it. Try it, or at least get a second opinion.

Remember the bumblebee. Remember the Wright brothers, who couldn't fly, either. ■

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An Open Book

The Comprehend **interactive-novel series** features graphics and some new and updated titles. An enhanced version of Transylvania is available now, and Polarware/Penguin Software has added the Crimson Crown, Oo-Topos (a science-fiction adventure), and Frank and Ernest's Adventure, based on the comic strip Frank and Ernest. Also appearing this year will be Margaritaville, based on an upcoming Jimmy Buffet movie, and updated versions of The Quest and The Coveted Mirror. These interactive computer novels will retail for \$34.95, from Polarware/Penguin Software, 830 Fourth Avenue, P.O. Box 311, Geneva, IL 60134, (312) 232-1984. For more information circle number 357 on the Reader Service card.

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Use your Apple II and the Voltage Plotter to measure, record, and **graph voltage levels**. Additional circuits described in the manual let you monitor pH, force (with strain gauges), and temperature (with a thermocouple). Use the Voltage Plotter with either a voltage input unit (available as a kit or already assembled) or an advanced interfacing board from Vernier Software. Voltage Plotter and other laboratory interfacing programs are available from Vernier Software, 2920 SW 89th Street, Portland, OR 97225, (503) 297-5317. For more information circle number 360 on the Reader Service card.

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how to prepare for tests, improving one's attitude, following test directions, objective questions, subjective questions, and a post-test. Improve your score for \$54.95, from Microcomputer Educational Programs, 157 South Kalamazoo Mall, Suite 250, Kalamazoo, MI 49007, (800) 421-4157. For more information circle number 354 on the Reader Service card.

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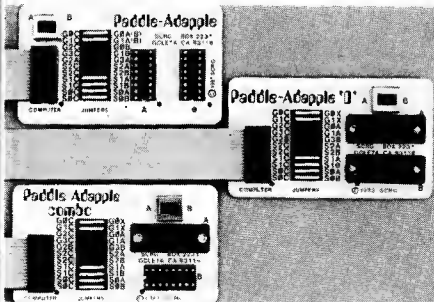
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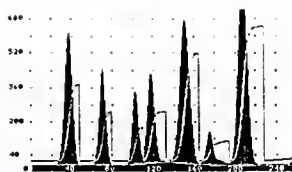
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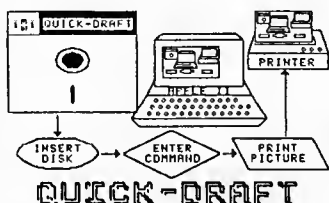
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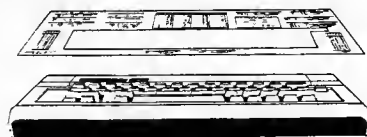
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● Look for clones of the **Franklin Ace 2000** in selected Sears outlets this summer—maybe the sleek compatible will be in the *Christmas Wish Book*, too?

● The **FischerTechnik robot kit** from Germany, a BMW among bicycles of hardware toys, comes in a "sophisticated" model now: It has a three-axis training arm for big projects. \$299 from Fischer America, 175 Route 46 West, Fairfield, NJ 07006, (201) 227-9283.

● If you run a "qualified" BBS, U.S. Robotics has a half-price offer for you on its **Courier 2400**, a 2400-baud modem. Call U.S. Robotics at (312) 960-5928 for more information. That's a voice line, by the way.

● If you hurry up and buy an **Accelerator IIe** before July 15, Titan Technologies will throw in **Pinpoint**, the popular AppleWorks desk accessory, at no cost. For \$299, you get the \$69 Pinpoint package and \$20 off the accelerator board. Waste no time—call Titan, 310 West Ann Street, Ann Arbor, MI 48104, (313) 662-8542.

● **Infocom** is now a division of **Activision**. Activision, a visionary among game makers, brought innovations like *Hacker*, *Little Computer People*, *Countdown to Shutdown*,

and *Borrowed Time* to the market. The marriage with Infocom should make both partners happy. Infocom is located at 125 Cambridge Park Drive, Cambridge, MA 02140, (617) 492-6000; Activision at 2350 Bayshore Frontage Road, Mountain View, CA 94043, (415) 960-0410.

● Polarware/Penguin Software did readers a favor and rescued Softalk Books from the dread fate of "out of print." **Apple-soft Isn't Hard**, by one of our local heroes, Doug Carlston, Roger Wagner's **Assembly Lines** (it might be cheaper to read his *Right of Assembly* column in *inCider*), and **Graphically Speaking**, by "Graphics Magician" Mark Pelczarski, are priced at \$14.95 each. Polarware/Penguin, 830 Fourth Avenue, Geneva, IL 60134, (312) 232-1984.

● The latest versions of **PlusWorks** and **PlusWorks XM** let Apple II Plus users run any version of AppleWorks, from 1.0 to 1.3. The XM edition also expands the AppleWorks desktop up to a megabyte, adds a RAM disk, and offers as many as 4222 records in the data base. Both from Norwich Data Services, P.O. Box 356, East Norwich, NY 11732, (516) 922-9584.

● Users of the ADALAB data-acquisition board and other laboratory input/output devices for the Apple II should be reading **Interactive Microware's Newsletter**. Sure, the company has products to sell, but it gives away lots of tips and tricks for laboratory computerists, too. Interactive Microware, P.O. Box 139, State College, PA 16804, (814) 238-8294.

HINTS/TECHNIQUES

Apple users know that there's always an easier way to get the job done. A shortcut here, an elegant twist there. That's what Hints/Techniques is all about. It's an information swap for readers who want to share their programming pointers, DOS tips, hardware secrets, AppleWorks applications, WPL enhancements, and all those other insights that make you go "Aha!" in the night. So read on and see if you don't find just the solution you've been looking for.

Binary-to-Text Converter

by Thomas L. Muller

Have you ever had a hot game you wanted to upload to your favorite bulletin-board, but you didn't know how to transfer the binary shape tables when only ASCII (text) transfers were available? You couldn't face the thought of typing all those addresses and hex codes into a text file, so you forgot the whole idea.

Your problems are now solved. The Applesoft program presented here (see the **Program listing**) converts any binary file to a text file, but, unlike some conversion routines, doesn't require an additional program to regenerate the binary file (for example, Listing 5 in "Private Lines," *inCider*, May 1985, p. 38). Instead, this program regenerates the original binary file from the text file and stores it to disk with only the EXEC command.

Details of Operation

Binary-to-Text Converter first loads the binary file, then performs four PEEKs to determine its starting address and file length. Beginning at the starting address, the program reads the value in each memory location, converts each value to hex code, and writes it to a text file. The converter generates the hex code by splitting each byte into two 4-bit parts, each representing a number from zero to 15. IF statements convert the number to a string from zero to 9 or A to F. String addition of the two parts then produces the hex code. The program calculates hex code for the addresses the same way, except that four parts must be determined.

To make the text file EXECable, the program adds CALL -151 to the beginning of the text file to put the computer into Monitor mode. The commands 3D0G and BSAVE at the end of Binary-to-Text Converter take the computer out of Monitor mode and save the binary file to disk.

The only hitch with any conversion program that loads a binary file is the possibility that the binary file may occupy the same memory as the program. If you don't get the message

FINISHED at the end of the program, that's probably what happened. Just type in the three POKES listed in line 6, reload the program, and run it again. These POKES let the program load into memory above the second high-resolution graphics page. That should leave plenty of room below for all but the largest binary file. ■

Write to Thomas Muller at 156 Starr Road, Newark, DE 19711.

Program listing. Binary-to-Text Converter.

```
5 REM THIS ROUTINE CONVERTS A BINARY FILE TO A TEXT FILE THAT
CAN BE EXEC'ED .
6 REM IF THIS PROGRAM DOESN'T WORK, IT MAY BE THAT THE BINARY
FILE OCCUPIES THE SAME MEMORY AS THIS FILE. TRY POKE 103,1 :
POKE 104,64 : POKE 16384,0 THEN RELOAD THIS PROGRAM AND TRY
AGAIN.
10 DIM H$(8),A$(2)
15 CLEAR :D$ = CHR$(4)
20 INPUT "BINARY FILE NAME? ";FILES$
30 PRINT D$;"BLOAD";FILES$
40 TFILES$ = "T-" + FILES$
50 AD = PEEK(43634) + 256 * PEEK(43635)
60 LN = PEEK(43616) + 256 * PEEK(43617)
70 PRINT D$;"OPEN";TFILES$
80 PRINT D$;"DELETE";TFILES$
90 PRINT D$;"OPEN";TFILES$
100 PRINT D$;"WRITE";TFILES$
110 PRINT "CALL -151"
120 FOR J = 0 TO LN - 1
140 I = I + 1
150 IF I = 1 THEN GOSUB 300
160 Y% = PEEK(J + AD)
170 N2% = Y% / 16
180 N1% = Y% - N2% * 16
190 IF N1% < 10 THEN H1$ = STR$(N1%)
200 IF N1% > 9 THEN H1$ = CHR$(N1% + 55)
210 IF N2% < 10 THEN H2$ = STR$(N2%)
220 IF N2% > 9 THEN H2$ = CHR$(N2% + 55)
230 H$(I) = H2$ + H1$
240 IF I = 8 OR J = LN - 1 THEN GOSUB 430
250 NEXT J
260 GOTO 460
300 AR% = AD + J
310 A$(2) = AR% / 256
320 A$(1) = AR% - A$(2) * 256
330 HAS$ = "": FOR L = 1 TO 2
340 N2% = A$(L) / 16
350 N1% = A$(L) - N2% * 16
360 IF N1% < 10 THEN H1$ = STR$(N1%)
370 IF N1% > 9 THEN H1$ = CHR$(N1% + 55)
380 IF N2% < 10 THEN H2$ = STR$(N2%)
390 IF N2% > 9 THEN H2$ = CHR$(N2% + 55)
400 HAS$ = H2$ + H1$ + HAS$
410 NEXT L
420 RETURN
430 PRINT HAS$;" ";H$(1);" ";H$(2);" ";H$(3);" ";H$(4);" ";H$(5);" ";H$(6)
;" ";H$(7);" ";H$(8)
440 I = 0:H$(1) = "":H$(2) = "":H$(3) = "":H$(4) = "":H$(5) = "":H$(6) =
"":H$(7) = "":H$(8) = ""
450 RETURN
460 PRINT "3D0G"
470 PRINT "BSAVE ";FILES$;"A";AD;"L";LN
480 PRINT D$;"CLOSE";TFILES$
490 PRINT : PRINT CHR$(7);"FINISHED"
500 END
```

Keyboard Control in the //e and //c

by David A. Rachlin

In certain applications it would be handy if your program could determine whether or not you were holding down a key. A peculiarity in the wiring of the Apple //e and //c allows for just such detection.

Let's look first at how the keyboard is designed to work. When you press a key, its ASCII value, a number from 128 to 255, appears in the keyboard input, memory location 49152. This value remains either until you press another key, when the new value is substituted, or until the keyboard input is cleared by reading from or writing to the keyboard strobe at location 49168. (The keyboard input is considered cleared when it contains a value of less than 128.)

Reading from the keyboard input lets a program detect that you've pressed a key, but not whether the key remains in the down position. A reasonable solution would seem to be to activate the keyboard strobe just before reading from the keyboard input. But this doesn't work. If you press a key and the program then activates the strobe, the keyboard input remains cleared even if the key stays down. You have to either press the key again or use the built-in repeat.

As it turns out, however, the keyboard strobes of the Apple //c and //e are rather peculiar. While reading from the strobe clears the content of the keyboard input, this operation also returns the ASCII value of any key you're holding down. If you're not currently holding down a key, a value of less than 128 is returned.

The following simple BASIC program takes advantage of this eccentricity to determine the true state of the keyboard. It indicates a keypress by repeatedly displaying on screen the character associated with the key only while you're holding it down:

```
10 A=PEEK(49168)
20 IF A>127 THEN PRINT CHR$(A);
30 GOTO 10
```

Try this program on the Apple II Plus to verify the difference in the //e and //c. Although it doesn't work on the older machine, the results are at least entertainingly bizarre. ■

Write to David Rachlin at 0-85 Morlot Avenue, Fair Lawn, NJ 07410.

A Customized AppleWorks Accessory

by Neil J. Stone

One AppleWorks accessory that really comes in handy is a Notes/Calculator/Calendar file you can create on a spreadsheet. First, set up a spreadsheet file and call it A.calc.calendar (see the **Figure**). The first several rows are reserved for notes; the middle section can accommodate calculations; and the final area contains a calendar.

When you set up your accessory file, the following points are important to remember. Within the Notes section, list rows with lowercase letters instead of numbers. This will prevent your spreadsheet cell from treating the number 1 as a value rather than a label. If you want to number your items you must type shift-' first, so that the cell will contain a label, not a value.

In the middle portion, Calculator, it's helpful to have frameworks for repeated calculations. For example, if you need to calculate body-mass index (BMI), you can set up weight/height² (as in the **Figure**) so that the spreadsheet immediately yields the value for BMI.

Finally, type in Month, Day (number), Day, and a space for the event you want to note (called Important to

Note), and fill them in to produce a sequential calendar of events. Using open apple-A, you can arrange your calendar according to any column: Even if you haven't typed in the dates in order, the AppleWorks spreadsheet can order them. And with open apple-I and open apple-D you can type in and delete lines for events.

The result is a file you can access easily with open apple-Q while you're working on other files. With headings such as Calc and Calendar, you can use open apple-F to guide you to the section you want to access, or you can just scroll down using the open-apple key and the numbers 1-10. Although fancier accessories are available, this one offers the advantages of customization and speed—with no extra disks. ■

Write to Neil Stone at 707 North Fairbanks Court, #1210, Chicago, IL 60611.

Got a hint of your own? inCider would like to see it. If we can use it in *Hints/Techniques*, we'll buy it from you. Send your tip to inCider, 80 Pine Street, Peterborough, NH 03458.

Figure. Notes/Calculator/Calendar accessory for AppleWorks.

| | | |
|---|-------------------|-------------------|
| File: A.Calc.Calendar | REVIEW/ADD/CHANGE | Escape: Main Menu |
| =====A=====B=====C=====D=====E=====F=====G=====H===== | | |
| 1:NOTES | | |
| 2:===== | | |
| 3:a. | | |
| 4:b. | | |
| 5:===== | | |
| 6:CALC. | | |
| 7:BMI = 703.1 * WT/HT2 | | |
| 8: 155=WT | | |
| 9: 69.5=HT | | |
| 10: 4830.25 | | |
| 11: 22.6=BMI | | |
| 12:===== | | |
| 13:CALENDAR | | |
| 14: MONTH DAY(no.) DAY Important to Note | | |
| 15:===== | | |
| 16: | | |
| 17: 1 15 Wed NutritionMtg; Galter Room; 7:30 pm | | |
| 18: 1 16 Thu Lunch-John Q Public | | |
| ----- | | |
| A1: (Label) NOTES | | |
| Type entry or use @ commands | | @-? for Help |

Beagle Bros Apple® Software Report

Ad Number 252

"All the News That Fits"

Spring 1986

TRIPLE-DUMP

Print any Apple image on your dot-matrix printer.

Use Triple-Dump with any Apple II and your dot matrix (graphics capable) printer to print:

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Unprotected, ProDOS and DOS 3.3
Compatible with any Apple II
Written by Mark Simonsen and Rob Renstrom



SHAPE MECHANIC

Hi-res shape animation and fancy hi-res typefaces



Shape Mechanic converts your hi-res drawings

into "shape tables" so you can create title screens, charts and animation with Apple's built-in Draw and XDraw commands. "List and Learn" demos on the Shape Mechanic disk teach you how to create your own hi-res programs.

HI-RES TYPE: 30 proportionally spaced hi-res screen display fonts (both large and small) are included on the Shape Mechanic disk. Each character may be redrawn as you choose.

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MODS COMPUTE SKINNY
FATSO L.E.O. EMBOSSE
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SQUARE 200 LUCKY \$

Shape Mechanic's new "SHAPE CAPTURE" feature lets you convert a section of any normal hi-res picture into a shape table.

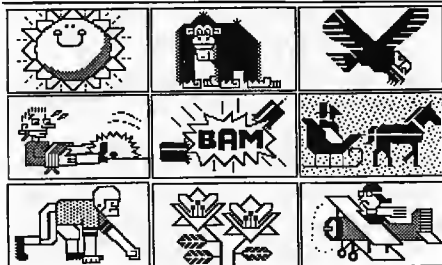
No fee required to use Shape Mechanic's fonts & routines in programs that you sell. Just credit Beagle Bros in your program and manual.

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- Shape Mechanic ■ Alpha Plot
- Apple Mechanic ■ Beagle Graphics

...and almost any other Apple graphics program that deals with unprotected hi-res pictures.

Attention, PRINT SHOP owners!



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2. Mirror
3. Negative

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Minipix pictures by Fred and Sara Crane

"The Print Shop" is a trade mark of Broderbund Software, Inc.



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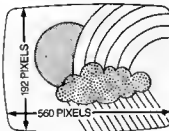
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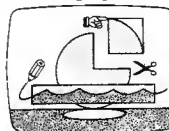


Beagle Graphics lets you use your 128K Apple to draw and label impressive double hi-res images (up to 560 pixels horizontally) using the Apple keyboard or, optionally, a joystick, AppleMouse, Koala Pad or Graphics Tablet.

And you can display 16 hi-res colors with over 200 color-mixes and fast area "color fills".

A **Variety of Typestyles** is included for labeling double hi-res pictures and charts.

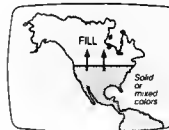
Beagle Graphics' CUT AND PASTE feature makes graphic manipulations a snap—Any



picture section may be individually altered or relocated to a new position on the screen. Or onto a completely different picture!

...OR FOR THE PROGRAMMER

You get 33 new commands for drawing, filling and manipulating double-res images. You can convert normal hi-res programs and pictures into



double hi-res, save and load any image section, compress picture data to 1/3 disk space, produce double hi-res "slide shows" and more.

READ THE REVIEWS: Family Computing, Feb. 86, gives its highest rating (★★★★) to Beagle Graphics in \$-Value, Graphics Quality, Documentation and Overall Performance.

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Unprotected, ProDOS and DOS 3.3
Compatible with any Apple IIc or 128K IIe
Written by Mark Simonsen



JUST
10 HGR2: CLEAR: ONERR GOTO 10
20 P=1+(P=1): POKE 49238-P,Z
30 POKE 230,32+P: POKE 28,C
40 CALL-3082: POKE 49235+P,Z
50 C=C+1: GOTO 20

FONT MECHANIC

30 new hi-res typefaces for Shape Mechanic (and Apple Mechanic)

Font Mechanic's fonts work with all of the programs on Shape Mechanic and Apple Mechanic:

OLD ENGLISH CRATE FINE
ZEBRA UNCLE BRANDING
Caesar & HOLLYWOOD
BELLS SANDWICH TIMES
U.S. OPEN 20130N &
COUNTDOWN ROOSEVELT

FONT UTILITIES: Font Mechanic lets you convert fonts from other disks (DOS Tool Kit, the Penguin disks, etc.) into fonts for Shape Mechanic and Apple Mechanic.

Distort fonts too (s-t-r-e-t-c-h, COMPRESS, etc.) for hi-res copy-fitting and special effects.

\$29.95

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Compatible with any Apple II
Written by Mark and Jon Simonsen

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EDITORS' CHOICE

Program Writer: A Word Processor for BASIC

Every month, hardware and software manufacturers release dozens of new products into the Apple II market. Editors' Choice singles out one product each month that the inCider editors feel is a significant addition to the Apple II family of products. Products evaluated in Editors' Choice are among the most recent releases and may not be available yet for retail distribution.

One of the recent major advances in artificial-intelligence research is computer software that writes, or helps you write, other code: in other words, programs that program. **Program Writer**, from The Software Touch, brings that research home.

Program Writer is a full-screen BASIC program editor. Don't make the mistake we did when Program Writer arrived at inCider: Program Writer is *not* a BASIC line editor. Programs such as Beagle Bros' GPLE and MicroSparc's GALE have been editing BASIC line by line for years now.

Former Beagle sibling Alan Bird has left home and done his little brothers one better: He's written a word processor for BASIC that does tricks some English word processors don't attempt.

Take macros, for instance. Imagine pressing a two-key combination that automatically writes `ONERR GOTO` or `PEEK() + 256*PEEK()`. You can create as many as 25 macros—and if you can't think of that many, Program Writer offers a sample macro file that breaks through some of the more common BASIC bottlenecks.

Program Writer's find and replace functions are suited to BASIC: This word processor looks for garbage, control characters, ends of lines, and literal matches. In addition to the usual words and phrases, it can even look for anything that is *not* a certain character—a feature that's useful for discovering, say, every `PRINT` not followed by a number.

You can also cut and paste parts of your BASIC programs—move them from one place to another, just as in AppleWorks.

In fact, Bird admitted to

us that he went out of his way—sometimes “a long way out of the way”—to make Program Writer work like AppleWorks. “There's a reluctance to use new products, because every new product takes so long to learn. By making Program Writer work like AppleWorks we make the learning easier,” he explains.

For instance, you'll find Program Writer's open-apple commands quite familiar if you're used to AppleWorks. Some are precisely the same, like the open-apple-digit commands that take you to ten corresponding places in your text or program. (If AppleWorks' command structure isn't your favorite, though, you can reconfigure Program Writer to work like your word processor.)

You can even wander through your Applesoft programs with a mouse, if you have one. That's more than you can say for AppleWorks (but watch Alan Bird and his buddy Marc Simonsen for some rodential changes in the AppleWorks interface this summer).

Program Writer is memory resident and compatible with DOS 3.3 and ProDOS. It works with any Apple II. You can load the editor into the “language card” or the bank-switched memory of your 128K Apple—and that leaves plenty of room for your Applesoft programs.

And your programs will all but write themselves. “Bird imagines Program Writer as a tool for experienced programmers,” Technical Editor Paul Statt notes, “but beginners have to get ahold of this package, too. It makes programming almost as easy as typing by taking away a lot of the silly hindrances built into Applesoft BASIC.”

Bob Ryan, *AmigaWorld's* technical editor (formerly inCider's) and ace BASIC programmer, wished he were back at inCider: “This is great.” When he recovered his wits, he admitted, “Okay, so it's about eight years late. It's still great. Nobody needs to buy one of those BASIC *line* editors anymore—they're a thing of the past.”

Program Writer is available for \$49.95 from The Software Touch, 9842 Hilbert Street, Suite 192, San Diego, CA 92131, (619) 549-3091. ■



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